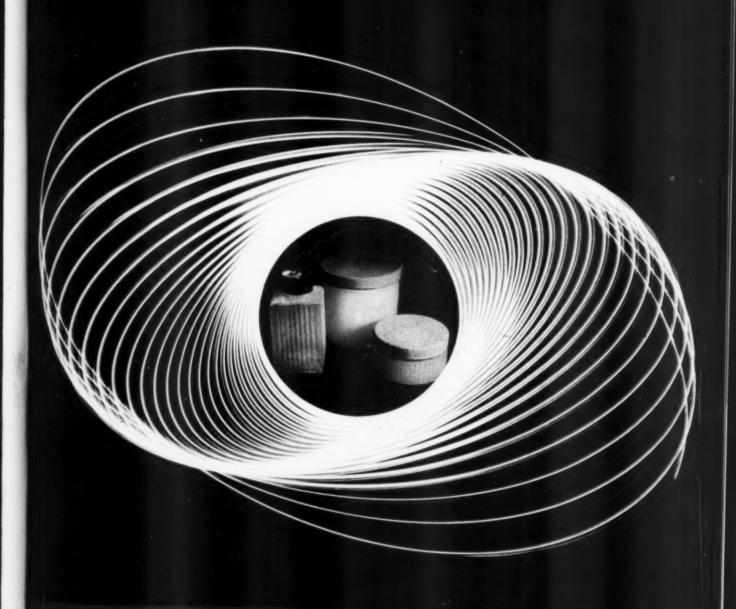
# AMD AROMATICS



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THE MAGAZINE OF TASTE AND, SCENT



of Phyllis J. Corter

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Landin Derivatives"

Laster J. Conrad

Triethenolamine Emulsions

Dy Pr. Poul G. I. Laufine

"Effect of Perfume Oils on Emulsions"

Water Wynne

By Maris Root

"The Mechanical Treatment of Emulsified Products"

capturing the true tradition of FINE PERFUMERY







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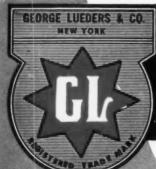
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VOL. 71, NO. 6



JUNE, 1958

Cover Photo this month by John H. Muller

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Please address all mail to: AMERICAN PERFUMER AND AROMATICS, 48 West 38th St., New York 18, New York, U.S.A.

PUBLISHED MONTHLY by Moore Publishing Company, Inc. Publication office: Emmett St., Bristol, Conn., U.S.A. Editorial and Executive Office: 48 W. 38th St., New York 18. NY. J. H. Moore, Charlmann of the Board; J. H. Moore, Jr., Fresident; Harold W. Spring-born, Vice President; G. R. Brennan, Secretary, Subscription Rates: U.S.A., Possessions and born, Vice President; G. R. Brennan, Secretary, Subscription Rates: U.S.A., Possessions and Canada, \$5 one year; 50c per copy. Foreign, \$15 one year. Entered as second class matter.

(Cable Address: Robinpub, N. Y. Volume 71, No. 6. Copyright 1958, Moore Publishing Co., Inc.)



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For more information, call the Owens-Illinois branch office near you today.

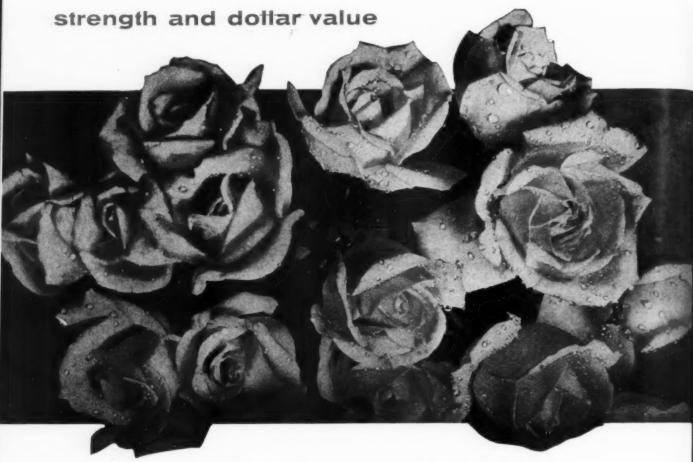
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# MINUTE NEWS . .

Hazel Bishop Inc. Sold to Syndicate of Tycoons

Raymond Spector, president and a holder of 60% of the stock of Hazel Bishop Inc. has sold his controlling interest in the company to a syndicate of which Serge Semenenko, who owns 30% of the stock of the prosperous Chemway Corp., is the head. Others in the group are the new directors: William Zeckendorf, real estate wizard and chairman of Webb & Knapp Inc.; Mathew M. Fox president of C & C Television; Retired General James A. Van Fleet, director of 20th Century-Fox Film Corp.; Charles F. McKhann, a director of Stanley Warner, American News Co. and Chemway Corp.; Wickliffe Shreve, partner Hayden Stone & Co. a leading financial house; and Morris Forgash, president, U. S. Freight Co. Mr. Spector sold all preferred and common stock equal to more than 60% of the company's stock at about \$4.50 per share or a total of about \$3,800,000. An offer no less favorable is to be made to other Hazel Bishop Inc. shareholders within three months. It is understood that Mr. Spector will continue as president and chief executive officer of the company under a five year contract. The Chemway Corp. of which Mr. Semenenko, head of the syndicate, is a large stockholder, was formed a few years ago to combine the operations of the Zonite Products Corp., Lady Esther, Ltd., Crooks-Barnes and Dunbar Laboratories. Ten years ago Miss Hazel Bishop a chemist, developed a nonsmear lipstick. Due to a lack of promotion it had only a mediocre success. In 1950 the Raymond Spector Co., an advertising agency, took the account which spent about half a million dollars in advertising, largely on a cooperative basis, and sales zoomed to \$4,500,000. By 1954 sales of over \$10,000,000 were made. By then Mr. Spector owned 90% of the stock of the company in which Miss Bishop had 200 shares. A stockholders suit in 1952 was settled by stipulation in which Miss Bishop received \$310,000 for her shares. This gave Mr. Spector complete control of Hazel Bishop, Inc. From sales of over \$12,000,000 and profits of \$1,080,000 in 1950, sales fell below \$11,500,000 in 1954 with a net loss of \$460,000. In 1956 sales dropped to \$10,270,000 with a net loss of \$610,-000; and in 1957 the sales were \$10,006,000 with a net loss of \$996,048. President Fox of C & C Television, one of the new directors, in discussing the sale said "Mr. Spector built a great brand name for Hazel Bishop. We in C & C Television have built a vast bank of open time across the nation which will be used to promote the sale of Hazel Bishop Inc. products. Advertising is the life blood of any effective marketing operation. We intend to add new strength to Hazel Bishop Inc. to enable it to gain a growing share of the cosmetic market.'

Sales of Soaps and Detergents

Down from First Quarter of 1957

Sales of soaps and detergents for the first quarter of 1958 were slightly higher in both pounds and dollars than in the previous quarter, according to totals reported by 67 manufacturers representing a substantial portion of the industry. Tonnage increased 1% and dollars 2%. Total tonnage sales of soaps were up 0.1%, and detergents up 1.0%. Dollar sales of soaps were down 0.8%, while detergents were up 3.3%. Synthetic detergents continued to increase, compared to soaps, and now are 72.2% of the combined total tonnage and 70.2% in dollars.

Comparisons with the first quarter of 1957 are less favorable, with total soaps and detergents down 6.4% in pounds and 2.3% in dollars. The first quarter of 1957 was, however, the highest first quarter in six years.

W. J. Bush & Co. Ltd., London, to Continue Operations in U. S.

W. J. Bush & Co. Ltd., London, England, the 107 year old producer of essential oils and food flavors has announced that its trade marks and the right to use the name "W. J. Bush" were not included in the sale of the trading assets and liabilities of its subsidiary company in the United States to R. D. Webb & Co. Inc. The name of "W. J. Bush" and trade marks have been taken over by a new company under the continuing name of W. J. Bush & Co. Inc. which has been incorporated in Delaware. This company will not undertake any manufacturing but the Bush Group will continue to develop appropriate business in the United States on an import basis.

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### Morton Edell Lanolin Plus President After Merger

Following the merger of Diversified Drug Associates, Newark, N. J. and its subsidiary operations into Lanolin Plus Inc., Chicago, Ill. Morton Edell, founder of Diversified Drug Associates and former president of the Vitamin Corp. of America and also of Helaine Seager Inc. has been elected president of Lanolin Plus Inc. Diversified Drug Associates is to be dissolved and all of its operations are to be consolidated into the Lanolin Plus line and handled by its existing sales force. In the cosmetic field Mr. Edell established an enviable reputation for his distribution of such products as Pink Ice, Tint-n-Set, Wash-n-Curl and Hal-O-Gene by his company. Mr. Edell has moved to Chicago to assume his administrative tasks. James P. Selvage continues as chairman of the board and William N. McCormick who has had broad export experience will be in charge of the international operations as vice president. Stanley Leifer executive vice president of Dunnan & Jeffrey, an advertising agency, is reported to be slated to join Lanolin Plus Inc. Plans are being formulated to increase sales of the companies various products. No change in the company's personnel is contemplated.

### Are Home Permanent Sales Slipping or Leveling Off?

Sales of home permanents in 1957 according to a careful estimate were between \$73 and \$76 million dollars at the retail level and between \$44 and \$46 million dollars at the manufacturing level. This was a drop of about 17 per cent from sales in 1956 and about even with sales in 1955; and would seem to indicate that sales are either slipping or at best leveling off. Home permanent business it has been pointed out does not appear to have kept pace with the general upward trend of cosmetics. Some observers feel that it is not going to get better as they point to these facts: 1. Growth of the beauty salon business since World War II. 2. The better economic status of the housewife, main customer for a home permanent. 3. Hair styles coming into vogue such as the pony tail and feathercut. 4. Advances in hair sprays which make home permanents last longer and in some instances reduces the need for a permanent. 5. The fact that home permanents are a chore often requiring the services of another to apply them.

### Connecticut Chemical Research Corp. and Powr-Pak Inc. Merge

Powr-Pak Inc. and the Connecticut Chemical Research Corp., contract packagers of aerosol pressurized products in Bridgeport, Conn. have merged under the name of Power Pak-Conn Chem, Inc. Edward F. Helfer is president of the new company. Jack Shenberg is executive vice president. The new plant at 145 Howard Ave., Bridgeport, was opened June 6. The new company is believed to be the largest organization in in the aerosol industry.

### Twenty-five Years of Useful Reporting by the Givaudanian

With its May issue, the Givaudanian, the monthly periodical of Givaudan-Delawanna Inc. celebrates its twenty-fifth year of continuous publication. As usual this issue has been skillfully edited by Leonard Stoller who has produced a highly interesting number. The cover, for instance, reproduces in miniature the cover of the first issue in May 1933 as well as the covers for July 1945 and May 1956 in addition to reproductions of two pages from earlier issues. Articles included are: "Phenylacetaldhyde and Hydratropic Aldehyde" by Dr. M. S. Carpenter which is written in a charming way; and the stimulating paper presented by Pierre Bouillette "Perfume-the Ever Present Persuader" at the fourth symposium of the American Society of Perfumers. This is followed by the second installment and the translation by Paul Adams of the book "Zartliches Brevier der Dufte" by Horst Maria. Perhaps the most interesting feature is the neatly laid out two page spread in the center of the issue reporting in a friendly and chatty way how the publication grew from its first number, consisting of eight pages of chemical, legal and cosmetic information, over the years through two wars, to its present stature, In the interval of a quarter of a century virtually every significant development in the perfume, cosmetic, soap and allied industries was discussed. These ranged from new discoveries in aromatic chemistry to the use of odor in paints, ink, rubber and other products and the development of germicidal soap to problems affecting the allied industries served by the company. Throughout emphasis was placed on the importance of fragrance in today's living. To the host of readers of the Givaudanian we add our congratulations on its anniversary and bespeak for it an ever increasing field of usefulness in the years to come.

ATL



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### DESIDERATA

Maison G. deNavarre, M.S., F.A.I.C.

### Hair Lacquer Base

One of the drug-chemical houses is offering a polyacrylic resin (Base 325) in a 50 per cent solids in alcohol as a concentrate for formulating aerosol hair sprays.

It is reported to have good adhesion, compatibility, water and solvent solubility and no wet-back. In water solution it has a pH of 7-8. One of the Tweens was found best as a plasticizer, with butyl stearate second. Castor oil and PEG 400 had only slight plasticizing properties.

The material can also be used in the conventional wave setting fluids with water as the main solvent and still retain its desirable properties.

### **Tinted Spray Dried Bubble Bath**

One supplier of an alkyl aryl sulfonate tints the material before spray drying. The resulting product is 40 per cent active and is available in pastel pink, yellow and blue shades. Add your perfume and you have a finshed product.

### Silicone Lotion

Walter Taylor has come up with a good-looking, stable silicone emulsion using one of his specialty emulsifiers. The product has a pleasing appearance and viscosity. It oven tests beautifully. Applies well. Walt's business is tailor made emulsifiers. He has saved some people a lot of lab work. Maybe he can help you, too.

### Wetting Agent Problem

Wish a company would spray dry a mixture of sodium lauryl sulfate and an alkanolamide foam stabilizer, to use as a bubble bath. Hand mixtures look good, but if tiny bubbles could be made, so much the better. But I can't seem to get any enthusiasm from suppliers to try it out.

### Notes:

The American Pharmaceutical Association was in its 105th annual convention at the Los Angeles' Biltmore during the week of April 20th.

I didn't get to the first couple of days' activities because the Scientific and Practical Sections were not in session. As in previous years, the cosmetic industry was poorly represented. There were Walter Fredell of Warner-Lambert, Bill Mueller of Toni and Bristol Myers' Jim Murray not to mention Beauty Counselors' deNavarre. One afternoon Max Factor's Paul Jewel sat in on a couple of papers.

The Practical Section had quite a session on the significance of pH values in predicting product stability and incompatibility. One speaker claimed 95 per cent of incompatibilities are due to a lack of understanding of the importance of pH. A paper ascribed to Parke-Davis was referred to by several people but none of whom I knew had ever seen it.\* A paper by Malmberg and Vincent on the use of Lantrol escaped me because I was in another session. Dr. Glen Sperandio cancelled out his paper on the formulation of an antiperspirant make-up base for use in television work. However, he did give a paper on sunscreen testing based on using a photographic film exposed to ultraviolet light passing through controlled quantities of sunscreen. Some may

recall this type of test back before spectrophotometric measurements were made. The present method is not the same. It is more exacting.

An interesting session on atherosclerosis, unsaturates, sitosterol, cholesterol and animal fats used on humans and animals took up a whole afternoon. To my way of thinking, Dr. Roslyn B. Alfin-Slater made a good case for unsaturates based on animal tests.

A couple of papers touched on using nonionics as preservative solubilizers or emulsifiers only to encounter difficulties. One paper showed how rancid oils could inactivate antibiotics including Neomycin but who in his right mind will use a rancid oil? True, if unprotected, oils and fats will go rancid and if antibiotics are present, they will become inactivated.

Sorby and Plein gave a paper on the absorption of radioactive ammoniated mercury from different bases. They found that abraded skin absorbed 5 times as much ammoniated mercury as intact skin. (note: bleach cream manufacturers)

The incompatibility of FD&C Blue No. 1 and Red No. 1 and D&C Yellow No. 10 with three cationic germicides was not exactly a revelation.

An interesting paper by Vander Wyk discussed the antibacterial testing of antidandruff preparations using scurf from human scalps. The method sounds interesting.

Pisano and Kostenbauder gave a second paper on the "interaction of preservatives with Macro-molecules, correlating binding data with required concentrations of p-hydroxybenzoates in the presence of Tween

\*Dean Andrew Bartilucci, St. John's University, has meanwhile sent me the reference (Parke T. V. & Davis W. W., Anal. Chem. 26, 642 (1954). 80. A knowledge of the degree of interaction between preservative and macromolecule permits calculating the amount of para-hydroxybenzoate necessary in the presence of Tween 80 and similar nonionics. If the figures I saw in the data presented as well as the subsequent discussion with Dr. Kostenbauder are so, my own work with G-3720 and the p-hydroxybenzoates does not confirm his results. But his approach was different, and it is possible that Tween 80 behaves differently than does G-3720. I'll check

this. But to get back to the paper by P. and K., they report that 0.28 per cent of methyl p-hydroxybenzoate will act as a preservative in the presence of 5 per cent Tween 80. This nonionic bound 80 per cent of the methyl paraben and 95 per cent propyl paraben in one series of experiments.

These are the highlights. Lots of other good papers were presented along with a few that had no place on the program. C'est la vie! Next year the A. Ph. A. meets in Cincinnati.

From Heyden Newport



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\*Esters of Parahydroxybenzoic Acid, Trade name "Parasepts" reg. U.S. Pat. Off.

Where tradition meets tomorrow in chemical progress

# **NOTES**

A revolutionary new cosmetic container made from Hercules Powder Co's high density polyethylene was introduced in New York recently. A new 16-ounce lightweight, non breakable container molded by Plax Corp. to package the John M. Breck Co's Banish shampoo, was shown. New containers made with the Hercules high density polyethylene employ blow molding making it possible to produce a durable, thin walled container with improved chemical and thermal resistance. The new container is believed to be the forerunner of a long list of bottles, containers and packages of intriguing shapes and colorability.

The English purchase tax on cosmetics and the majority of toilet preparations has been reduced from 90% to 60%. In many cases only a portion of the difference between 60% and 90% can be passed on as a concession to the purchasing public. Commenting on the reduction, Soap, Perfumery and Cosmetics of London says: "Bearing in mind the ever rising cost of production, this tax may fittingly be described as little enough and long overdue . . . The industry must hope and press for further relief."

The cosmetic excise tax applies to reuse containers according to a ruling of the Internal Revenue Service. Cosmetics packed in elaborate re-use containers such as flower vases, lamp stands, etc., are taxable at the full price, including the cost of the container according to Elliot Daitz, tax counsel for the T. G. A.

Eighty million dollars has been spent by Plough Inc. in newspaper advertising in the past fifty years according to data of the Bureau of Advertising of the American Newspaper Publishers Assn. which presented a bronze, swivel base desk piece with reproductions of the first and more recent advertisements of the company to President Abe Plough. The company and its subsidiaries manufactures numerous well known cosmetics.

One out of every three customers for cosmetics will be a good prospect for sun tan oils and lotions this Summer according to a survey by E. I. duPont de Nemours & Co.

Cosmetic excise tax collections for the quarter ended March 31, were \$31,-666,000. For the fiscal year to date the cosmetic excise collections were \$77,-132,000 or \$154,000 less than for the same period in 1957.

Sales of toiletries in drug stores in 1957 were 10.3% of the total national volume for all departments, numbering 14. American Druggists reports. Prescriptions, remedies and fountain exceeded toiletries.

HEYDEN

NEWPORT



# **AEROSOL PACKAGING**

# can give your sales "steamroller" power!

Here's how General Chemical

can help you get started...

If you've been watching the aerosol field, you've seen product after product come out in aerosol form and roll over its competition with irresistible force.

Could you market an aerosol that would have similar success?

A qualified "yes"

If your products can be sprayed, brushed on, dusted or daubed, aerosol packaging may well give them that vital "push." And now's the time to get started—while the field is still growing... while consumers still think of aerosols as "new" and exciting.

General Chemical can help you As the producer of "Genetron" aerosol propellants, General Chemical has the basic knowledge and specialized experience you need to get started. We will be glad to supply market information and technical data. We can tell you about promising new types of aerosol formulations developed in our laboratories. We can tell you about qualified contract fillers—who can take over the entire production job for you, from test market quantities to commercial production.

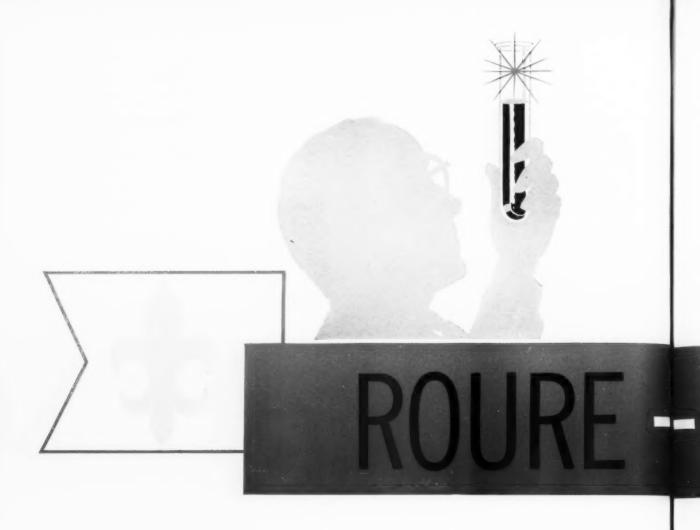
The fact is, you don't have to invest a cent in special equipment or personnel to get into this profitable market!

These information services of General Chemical are available to you without cost or obligation. Why not take advantage of them now? Just call or write "Genetron" Department, General Chemical Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N.Y.



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genetron® aerosol propellants



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# AERO SCRI





he Aerosol Associations in Europe are very much in the news at the moment. In February, 1958, notification of a meeting to be held by the International Aerosol Assn. of Zurich, Switzerland, was sent out. The meeting was actually held in Zurich on March 17 and 18. The meeting was attended by some 70 people. The objectives of the founders were put to a general discussion. These objectives are stated to be:-

- a) to manufacture better products.
- b) to prepare specific quality standards.
- c) to carry out market researches.
- d) to enlighten the buying public on the appropriate uses of aerosol prod-
- e) to devise authorities as to the laying down of legal regulations concerning aerosols.
- f) to support and to further scientific research in the fields of aerosols.

The articles of the I.A.A. have been derived from the Chemical Specialties Manufacturing Assn. in America.

Mr. Hans, representing the "Interessen Gemeinschaft für Aerosole" said that the German group attached more importance to actual questions than to obtaining technical information from America \*Chief Chemist, Polak & Schwarz, England, Ltd.

Further, they attached great importance to joint sales promotion activity and to the formation of publicity in schools for sales staffs. He observed also that many problems were only of local importance and did not fit into the activities of an International organization. Discussion took place on the desirability of forming either local groups or an International organization, or both.

Dr. Meurisch of Boehringer Ingelheim deemed a local grouping indispensible, whilst an International organization might have its uses. The formation of both types of organizations however, he thought would be too expensive to run.

Wähling of Skandinaviska Aerosol gave preference to an International organization (for instance, with a view to reaction of legal regulations such as the prohibition of the use of methylene chloride in insecticides in Denmark).

Mr. Taggert of The Metal Box Co., England, pointed out that to date, the organization of an association in the aerosol field had not been successful in England.

The provisional board moved as a form of organization:—

1. that the larger countries will form national alliances which can take local interests to heart, while the Inter-

national Aerosol Assn. itself may make available a central secretariate at the disposal of other countries. Smaller countries, such as the Benelux, who do not wish for such a service, may be represented directly in the LA.A.

that the provisional board be extended to an Executive Committee consisting of nine members, being as representative as possible for the participating countries

that a technical committee be formed, the members of which will represent as fully as possible the different trade groups.

4. that a publicity committee be established which, by availing itself of all means of publicity, will endeavor to make aerosol products better known. The following committees were elected for two years:-

- A. Executive Committee.
  \*Mr. G. M. Mayer, Switzerland (Precision Valve, Zurich)
  - \*Dr. E. J. Honisch, Switzerland (Aeroton A.G.)
  - Mr. E. Hirschburger, Switzerland (Aerosol Service A.G.)
  - Mr. Bouffe, France (Poitevine de Conditionnement.)
  - Dr. Dawson, England (Swallowfield Aerosols Ltd.)
  - Mr. Talvitie, Finland (Berner) Witjens, Holland (Polak
  - Schwarz)
- Mr. Romella, Italy (Solfrene) Open for Germany.

\*Selected for a period of one year.

### B. Technical Committee.

Boehringer Ingelheim. Skandinaviska Aerosol A.G. Des Jonqueres. V.D.M. Metal Box. Bombrini Parodi Delphino. Precision Valve.

Safca Paris. Open for propellant manufacturer.



Partial view of the Interessen-Gemeinshaft Aerosole meeting in Frankfurt, Germany



# here is a

young lady

When she is selecting her cosmetics, will the containers in which your products are encased be the most attractive she will see?

Discriminatin

And after those glamorous containers have remained on her dressing table for a time, or have been jostled about in her purse, will they still look better than the competitive items with which they have been rubbing elbows?

You can be certain that your lipsticks, pursers, compacts, rouge and mascara boxes, and other cosmetic containers will set the highest standards of beauty, fashion and quality—at the point of purchase and in use—when you avail yourself of the services and facilities of Scovill.

We will work with you on your own designs, create designs from your ideas, or design special containers exclusively for you. And more often than not, highly individualized containers can be built around our wide line of standardized components, thus keeping costs to a minimum.

Representatives qualified to discuss your cosmetic container problems may be reached in Scovill offices in these cities: New York—161 East 42nd St.—Oxford 7-3222 Chicago—4105 W. Chicago Ave.—Nevada 2-2303 Los Angeles—6464 E. Flotilla St.—Raymond 3-7221

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Join the growing family of manufacturers of soaps, toiletries, flavors and pharmaceuticals who insist on Shulton I-Menthol USP to guarantee their own product

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BENZYL ACETATE • LIGNYL ACETATE • GERANIOL
ISOEUGENOL • METHYL ANTHRANILATE • NITRO MUSKS
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### SHULTON FINE CHEMICALS

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### C. Publicity Committee.

Holmes.

Dr. Clark (Druk. Pak.)

Mr. Delmore of Precision Valve (Zurich) spoke on the latest aerosol developments in the United States from where he had just returned. His chief points of discussion were the aerosols filled with compressed gases. He said that in America as in Europe, such products were still in the development stage. In order to dispense a reasonable amount of product from a container by means of compressed gas, about 40 volumes per cent of the container must be filled with compressed gas with a pressure of 90 psi at 70°F. On emptying the container, the final pressure would still be in the region of two atmospheres. At an increase in temperature of 5°F. the pressure rises about 1 psi so that the testing temperature of 130°F. means a pressure of about 105 psi. Sterilization at 200°F. is possible in the normal containers. Experience has shown that loss of weight in the finished products is practically nil, even after a time lapse of about eighteen months. This is probably because the valves are not affected by the fairly inert compressed gas. Naturally, a modification of the standard valves to give a wider valve opening is necessary. Sometimes a dip tube of a special shape is required to guarantee a regular flow of the active ingredients. Products which should be considered in this field are toothpaste, coffee, chocolate and syrup.

Since the nitrogen which is generally used is not soluble in the active ingredient, there is no question of foam formation. The general advantages of the compressed gases were said to be absence of corrosion, no possibility of rancidity, low price of the propellant, inexpensive filling equipment. It was recommended that oxygen should be removed from the con-

tainer before filling.

### Meeting of German Association

From Germany, comes notice of the inaugural meeting of the Interessen-Gemeinshaft Aerosole in Frankfurt. April 15. The general idea was that a number of progressive firms in the consumer goods industry and aerosol packing industry, plan to found a co-operation of interests in aerosols. Their main aims were through voluntary co-operation to support the application of aerosols and to increase the sale of aerosol products. During preliminary talks which had taken place in past months in Frankfurt. the following points have been discussed. The co-operation of interested parties towards the solution of technical problems. The demand of general rationalization methods. The use of American aerosol experience. Representation of joint interest. Contact with the press, radio and T.V. and a study of joint propaganda possibilities.

The idea came from Mr. Hentzel of the German trade paper "Parfumerie und Kosmetik" who saw the necessity of such co-operation of interests during his many visits to European countries. The first group of people interested in starting such a co-operation was made up of



Friedrich H. Hans leading the foundation meeting as secretary of the new association.

manufacturers of consumer goods who wished to see their products packed in aerosol form, together with suppliers of raw materials, packing materials and, of course, finally the contract loaders.

Membership will not be grouped by country or by fields of activity. The original letters were written in German but in the future, any other language can be used as may be the wish of the members.

It was thought that the talks which had so far taken place had proved that it was high time that an association should commence to tackle some of the acute problems which existed. The aerosol industry was so far developed that it could no longer be regarded as a merely experimental movement. Much as cooperation was required, it was not thought that there should be any obligation placed on individual members as far as their research work and experiences were concerned. An internal exchange of information could, of course, be given if the firm in question was prepared to circulate such information. Previous suggestions had indicated that a working programme might contain:

Solution of urgent technical problems. These include information on valves, containers, corrosion, filling techniques, testing, guarantee obligations and the legal position. The work on the above problems would be given to a technical committee which could be chosen from the members and should include technicians and experts

who have had experience in the different aerosol fields.

Thorough information of the aerosol market.

a) Information from own members.

- General information about development in aerosols, especially from the U.S.A.
- c) Information from the world trade papers.
- d) General interesting contributions of the members.
- e) Information about activities of the sub-committees.

Work, editing and publishing will be taken care of by the association office in Frankfurt, and will be issued in the form of a monthly information letter. These information letters will be sent free of charge to all members. If, in the future, it should prove necessary to introduce subscriptions for these information letters, this can always be taken care of.

3. Representation of general interest of the members.

- a) Processing of requests and individual wishes for information of the members.
- b) Contact with press, radio and T.V.c) Issuing of news to overseas press.
- d) Membership and making use of membership with important parallel organizations such as C.S.M.A. of U.S.A. and I.A.A. of Switzerland.
- e) Study of public relations and possibility of later increasing the membership.

This work can also be taken care of in Frankfurt if the full cooperation of the sub-committees and old members can be counted upon.

It is suggested that the legal aspect can be left undecided and after about one year, legal forms can be decided upon. At any rate, a committee should be chosen for running the association (5-7 members) and this could be elected by

The temporary management of the association will be in the hands of Mr. Hans. Monthly contribution of each member would be DM 30/50. No budget for the association can be drawn up before its exact field of activities has been decided upon.



I.G.A. from r to 1, Herbert Berberich, Director Hans Schloss, Richard Waldherr, and in the left foreground, Edward Lohr.







Chemical Engineering



Chemical Research



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VAH Perfume Evaluation Board .... Unmatched in their ability, these professionals screen every pertume sample on the basis of its intrinsic beauty as a fragrance, its adaptability. to a specific market, its potential level of consumer acceptance, its relationship to both competitive and companion items... Not the opinion of an amateur panel, but the recommendation of this experienced board of experts goes with every perfume sample submitted by VAH.

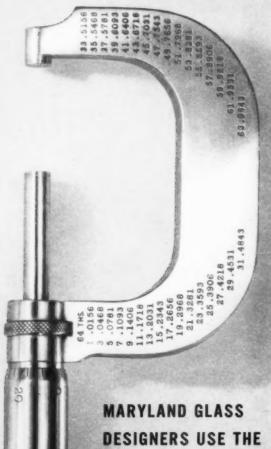
> A perfume by VAH has all the ingredients for beauty and success.

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# ATTRACT IN MARYLAND GLASS

Blue or Flint . Jars and Bottles

### 1289: SKIN BLEACHING AGENT

Q. Is there a skin bleaching agent which can be incorporated in cold cream that will be safe and effective? The idea is to lighten skin rather than remove blemishes. C. S. H., Louisiana.

A. A so-called safe bleaching agent that can be used in cold cream for the purpose of lightening the color of the skin is ammoniated mercury. It is used generally in an anhydrous vehicle and its use is governed by the Food and Drug Act. Labeling requirements will be found in deNavarre's book, "The Chemistry and Manufacture of Cosmetics." If there is such a thing as a "safe bleaching agent" then this is probably the safest of the lot. It seems to work and when used as directed, produces a lightening of the skin. There are a number of cases of people sensitive to mercury and of course these people will be unable to use it. Patch testing and other procedures required by law must be mentioned on the labelling of the product when offered for sale in interstate commerce.

### 1290: PERFUME OIL

Q. I would like to know what the concentration of oil in percentage per gallon of alcohol is used in the so-called better quality perfumes on the market? B.W.D., Virginia. A. There is no fixed concentration of oil used per gallon of alcohol to make so-called high quality perfume. The selling price depends upon the cost of the finished product, and you can add anywhere from 16 ounces to 32 ounces of perfume oil compound in enough alcohol to make one gallon of perfume extract. Your selling price will then be guided by your cost. The concentration used is in part dependent upon the fragrance itself. It should be strong but not obnoxiously so. Fixatives and floral waters are also generally used with the perfume oil.

### 1291: HAIR DYES

**Q.** Please send us the name of the publisher of the German book on hair dyes. R. M. L., Ohio.

A. This book is "Haarfarben und Haarfarbung," by F. Winter and has been reprinted by Continental Press, Inc., 14812 Alma Avenue, Detroit 5, Mich.

### 1292: HAIR BLEACHING

Q. I have been using quite satisfactorily until now magnesium carbonate for hair bleaching in conjunction with hydrogen peroxide. Could you let me know what product to use in order to boost its effect for quicker action, such as the "Roux" and "Clairol" people have in the U. S. market or "Oreal's" on the European side. I have been thinking of sodium bisulfite, sodium hydrosulfite or sodium perborate but before making any experiment, I wish to have your opinion as to the toxicity of such and on what basic proportion to start. C. M. C., Brazil.

A. We could not begin to guess what "Roux," "Clairol" or "Oreal" do in their respective fields. You might use trace metal catalysts which are known to break down hydrogen peroxide more completely and furthermore, you might use stronger peroxide which we believe is common practice in beauty shops. Beyond this we would not suggest anything else. The additional material you mentioned are very poor bleaching agents. As far as sodium bisulfite or sodium hydrosulfite are concerned, these are used in permanent waving solutions. We suggest you stay with your peroxide but add metal catalysts such as are listed in any good chemistry book under the subject of hydrogen peroxide and also increase the concentration of your peroxide.

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# A \$100,000,000 Company

How and why the 70 year old Bristol-Myers Co. grew from a feeble infant that made no profits for its first 13 years into the giant it is today selling its products throughout the world and distributing them in the United States through over 55,000 drug stores and 200,000 food selling stores

H ISTORY IS A GREAT TEACHER. Today's business men, especially the younger ones, might be better equipped to remain calm and productive in the face of current conditions if they studied the business history of leading companies that have successfully weathered the storms and changing economies of the past century.

Worthy of examination in this respect is the long-established Bristol-Myers Co. It was founded in 1887 by William McLaren Bristol and John Ripley Myers, as the Clinton Pharmaceutical Co. (In 1900 the name was changed to Bristol-Myers.) In those post-civil-war days the Union of 38 states was slowly emerging from the 1884-86 depression. Congress had just established the Interstate Commerce Commission and about the same time the American Federation of Labor was organized. Both were destined to become forces of great importance to business.

The first public announcement of the newly formed Clinton Pharmaceutical Co. read, "No quack remedies or patent medicines will be produced. And, nothing but a standard line of pharmaceuticals will be produced." That policy helped establish for all time the integrity of a company that was to grow into a \$100,000,000 business within the next 70 years.

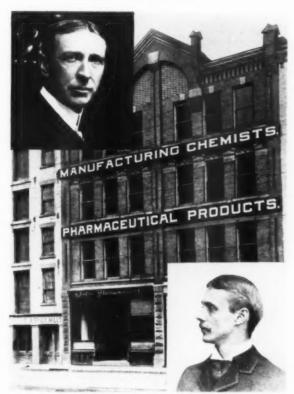
### No Profit for 13 Years

It was hard going at first. The company did not report an annual profit during the first 13 years of business. Despite such poor conditions, Mr. Bristol insisted that the company's good credit be maintained. This was done, even though Mr. Bristol's personal finances were often alarmingly low.

The business, however, continued to grow. Sal Hepatica was developed in 1896, and by 1898 the company

# Still Growing

HENRIETTA MEREDITH



William McLaren Bristol, Sr., top, and John Ripley Myers, founders of the Clinton Pharmaceutical Co. which later became Bristol-Myers Co.

was selling more than 3500 other products. In the following year John Myers died, only a few months before the company was to announce its first profit.

### Ipana Tooth Paste

By 1915 Bristol-Myers Co. had made great progress. It had discontinued activities in the prescription field to concentrate on proprietaries. Ipana tooth paste was first manufactured that year, and sold entirely through the recommendation of dentists and physicians. Present records show that B-M products are now sold in 55,000 retail drug stores and 200,000 food-selling stores. Ipana sales in 1957, according to independent research figures, placed it among the leaders on the list of nationally sold dentifrices.

From the beginning, research and product development have been integral parts of Bristol-Myers philosophy. According to Lloyd Bernegger, executive vice president and sales director, 50% of the products on B-M's list today have been developed within the past ten years.

It was just ten years ago that B-M jolted the drug industry with Bufferin, a headache remedy that today accounts for almost one-fifth of the market.

### **Ban Deodorant**

Then came Ban. Using a completely new idea in deodorant packaging, Ban was launched in 1955 and within a year had zoomed to first place in dollar sales among all deodorants. It took the rest of the industry several years to catch up and now several other deodorant brands have adopted the roll-on application technique.

### Anti-Dandruff Theraderm

With two new winners in a row, B-M research technicians really turned on the heat early in 1956 and in



Theraderm, a new anti-dandruff formula launched by B-M

the year just past, the 71-year-old pharmaceuticals company launched Theradan (recently changed to Theraderm), a new type anti-dandruff formula, and Ipana Plus, a revolutionary plastic squeeze-bottle dentifrice.

Indicative of the fine relationship between Bristol-Myers management and employees, credit went to a staff member, Marguerite Rittenhouse, whose suggestion led to the development of the Ipana Plus squeeze bottle. She had used a squeeze bottle in a Madison avenue cafeteria to apply ketchup. Why not, she asked a researcher, the same treatment for a tooth paste?

### **Aerosol Packed Tooth Paste**

Ipana Touch-n-Brush, a new pressure-packed tooth paste introduced nationally this May, adds still another dimension to the Ipana line. This touch-button packaging makes use of a perfected pressure can that uses inert nitrogen as a propellant. It dispenses the desired amount of tooth paste in the proper consistency—not like whipped cream, not like shaving cream.



Ipana Touch-n-Brush, Bristol-Myers entry in the Aerosol field.

Recognition of individual efforts most certainly helps account for the highly successful operation of the B-M sales department. Perhaps few other companies enjoy such low turn-over of sales personnel. It is no secret that Bristol-Myers will leave a sales spot vacant until it can be filled by an individual whose character and salesmanship reflect the company's long established trade policies. Each salesman, in fact every B-M employee, is made to feel that he personally reflects the company image to the world. Sherwood Chatfield, director of personnel, points out that promotion from within is the ever-active policy in every B-M department.

### **Promotion Activities**

There is no better indication of B-M's pioneering philosophy and aggressive leadership than the company's history in radio-TV advertising. In 1925 with the Ipana Troubadors, B-M became one of the country's first network radio sponsors. It's first television commercials



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# ATLAS certified colors

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Henry P. Bristol
Executive Committee Chairman
Bristol-Myers Co.



Frederic N. Schwartz
President
Bristol-Myers Co.



Lee H. Bristol Chairman of the Board Bristol-Myers Co.

were aired in 1946. In 1957, B-M spent an estimated \$12 million on network TV. And, according to Publishers Information Bureau, B-M is 9th on the list of the nation's top 100 national advertisers. Advertising Age listed total B-M advertising expenditures last year at more than \$19 million.

Among current TV vehicles for advertising B-M products are "Playhouse 90," a consistent award winner, the popular "Hitchcock Presents," and such solid ratinggetters as "Mickey Mouse Club," "Tombstone Territory," "Sea Hunt," "Beat The Clock," "Post-Fight Beat" and "Verdict is Yours."

Advertising for B-M products is handled by Doherty, Clifford, Steers & Shenfield, Inc., Batten, Barton, Durstine & Osborn, Inc. and Young & Rubicam, Inc. Donald S. Frost, B-M vice president and director of advertising says that the 1958 Bufferin national ad campaign will be the largest ever used to sell a drug product.

### Sound Public Relations

Public relations and product publicity also play an important part in keeping B-M products before the public. Lee H. Bristol, Jr. director of public relations of the Products Division says: "We are dedicated to seeing to it that we build the best possible image for our company, personnel, and products in the minds of our publics and to do all we can to improve morale and communications within the company.

"Bristol-Myers has many publics which must be reached in different ways: customers for our products; stockholders; suppliers; the Government; the medical world; schools and colleges; our plant town; the drug, food, and variety store trade; employees; the financial world; the trade and consumer press—all of them different publics with which the company must deal on a daily basis.

"Everyone in the company in some measure is a part of our continuing program to reach these publics. Whether a person's job be heading up production, working in traffic, quality control, in the lab perhaps, or whether a person's job be that of a porter keeping the plant swept clean, every employee is identified in the minds of some people—family, friends, neighbors—with the company."

### **Educational Service Department**

Believing that corporate service is the rent a company should pay for the right to exist and prosper in this country, Bristol-Myers maintains an Educational Service Department—staffed by ex-school teachers—to prepare and distribute public service materials. These include dental care booklets for use in schools, good grooming instructions, and better health materials to aid personnel directors in business and industry. Restaurants, hotels, banks, insurance companies and airplane manufacturers are among those that make use of B-M's free educational service materials.



Ida Crawford

Ida Crawford, director of Bristol-Myers' Educational Services, reports that over 12 million free booklets were distributed in 1957 by her department.

### How and Why Extensive Research is Conducted

While declining to comment on the number and categories of new products that B-M currently has in development stages, John J. Clarey, vice president and



E. Lloyd Bernegger Executive Vice President Bristol-Myers Products Div.



Wm. McLaren Bristol, III
President
Bristol-Myers Products Div.



Lee Bristol, Jr.
Public Relations Director
Bristol-Myers Products Div.

director of the products planning division, says that behind-the-scenes research is a never ending activity with B-M.

In 1957 the amount spent by all divisions for research exceeded \$4 million. New product research is conducted on a five-point plan:

- Estimating the market to evaluate potential sales.
   In the case of a completely new product this information is often developed by extensive interviews with prospective users.
- Blue printing the product, in which research tries
  to find out the specific qualities—taste, fragrance,
  color, consistency, etc.—people would like in a new
  product. For the past eight years, this information
  has been developed for the Products Division by
  Alfred Politz Research.
- 3. Preliminary screening of the preparation sometimes involves the testing of hundreds of combinations of ingredients before the final formulations are arrived at. The same procedure is followed in the development of packaging. When work was being done on Ban's ball point applicator, approximately 480 combinations of different plastics were tested before B-M laboratories found the right solution of two compatible plastics which would not react to heat conditions and to the active ingredients of the lotion.
- 4. Final consumer pretesting takes place after the product has been narrowed down to one or two finalists. Samples of the product and a competing product are mailed to a panel of up to 7,000 individuals, carefully selected on the basis of occupation, income and location. The identity of the products has been completely concealed. Panel members are asked to use the samples for the specified period—usually two weeks—and then to fill out a question-naire giving their opinion of each one. Improvements in formulations of products which are actually on the market as well as of new ones have often resulted from these questionnaires.
- Sales testing is done after a favorable verdict is received from the consumer panel. During this sales test the product is actually put on the market in representative areas throughout the United States.

Independent research firms are employed to make continuing checks of the sales of the product and its competitors in selected drug and food outlets.

People who buy the product are interviewed not only at the time of purchase but also after a lapse of several months to see if they are still using it. The reaction of the retailers to the product is also studied so that the Sales Department can predict how much promotion by the trade can be expected.

From the consumer and trade data, management can make an informed prediction of what the product will do if it is introduced nationally—and whether such an introduction would be worthwhile.

Continuing research on product performance gives management up-to-the-minute information about the sales of B-M products. The most modern electronic calculating equipment is employed in gathering these important facts. The statistics are used by management to guide it in forecasting sales, preparing budgets, revising advertising plans, meeting rapidly changing situations.

Market research maintains a continuing evaluation of the movement of all B-M national brands in retail drug and food outlets, as a corollary to the information developed from analyzing sales to customers. Data for



these reports are supplied by many outside consultants, such as the A. C. Nielsen Co. and Towne-Oller Associates. The reports are useful in developing marketing strategy, and also in helping sales representatives plan promotions. It was through these reports, for instance, that it was first learned that Bufferin had become number one in drug stores, and Ban the largest dollar volume deodorant on the market.

### Keeping Posted on Consumer Attitudes

The consumer attitude toward Bristol-Myers products is of unquestionable importance. To evaluate it, the company conducts question interviews on every product at least twice a year among a representative cross-section of consumers throughout the country. From these surveys it is learned for each brand whether the most productive customers are men or women, whether they are young or old and whether they live in the city or in rural areas. From such surveys, it is learned, moreover, what people like or dislike about Bristol-Myers products and their competitors, as well as what people think about current advertising compaigns. From this information the company's advertising executives and agencies not only can select the media which will be most effective for each product, but can often develop effective new themes for forthcoming campaigns.

Growth is by now a well-established habit with Bristol-Myers. Expansion within the past few years has included the acquisition of Grove Laboratories, Inc. One of the nation's oldest manufacturers of proprietary medicines, Grove's sales during the past two years have run in excess of \$10 million annually.

Kimball Manufacturing Corp. of San Rafael, Calif., makers of plastic products and Luzier, Inc. of Kansas City, Mo., a leading cosmetic manufacturer, are other recent acquisitions. Bristol Laboratories, Inc., in the ethical field and Bristol-Myers International, with repre-

sentatives and subsidiaries in many countries around the world, are the other leading B-M divisions.

### Anti-Recession Action

Last April, B-M took decisive anti-recession action by announcing a special deal in which customers could place orders for immediate delivery and take up to 90 days to pay without losing their cash discounts. Ten to 40 days is the usual discount period in the industry. In making the announcement, William M. Bristol, III, Products Division president, said: "During this period of a hesitant economy many distributors and merchants are making every effort to control inventories more carefully. Reduced inventories on Bristol-Myers fasturnover consumer products inevitably leads to retail out-of-stock. Continuation of retail out-of-stock in turn, leads to real lost sales and profits for you.

"In order to assist in reversing this present economic indecisiveness and in a determination not to let retailers suffer as a result of any reduced inventories and consequent out-of-stock of B-M products, our Products Division is acting on the recommendation of thoughtful business and political leaders, "to buy!"

"Our unique discount plan, we like to think, represents a positive expression of our faith in the continuing growth of our economy."

A week later, B-M President Frederic N. Schwartz told stockholders at the annual meeting, "We at Bristol-Myers have confidence in the future of America. We don't pretend to have all the answers as to why this recession developed, but we do feel quite positively that there's far too much gloomy talk about it. I don't know why vice always gets more publicity than virtue, but it does. Isn't it, after all, the way you look at things—a glass is either half full or half empty depending upon your point of view."

### Lecithin and Plant Phosphatides

t is, of course, well known that plant phosphatides are useful soap additives, mainly because of their valuable emollient properties in super-fatted soap and their ability to improve the texture and appearance of good quality toilet soap.

Although at one time, it was thought that the phosphatides from soy-bean oil were varieties of lecithin combined with fatty acids, such as palmatic, stearic and oleic, it is realised today, mainly owing to the pioneer work of Levene and Rolf, that phosphatides are not made up entirely of lecithins, but a mixture of lecithins with cephalin containing palmitic, stearic, oleic, linolenic and linoleic acids. There is also present in the phosphatides from soy beans, easily the most important source, various carbohydrates in the form of free sugars and glycosides.

Not only is the lecithin content very complex, this sterol being present in several isomeric forms, but the non-lipid constituents are also complex. Whereas it is not too difficult to obtain relatively pure cholesterol, which is so often associated with lecithin in many applications, the same cannot be said about the vegetable or plant sterol. Commercial phosphatides may vary in their lecithin content according to the origin of the beans, the methods and conditions of extraction and storage and the age of the compound. Phosphatide mixes are also sensitive to the presence of strong alkalis (and also strong acids) and saponification may be accelerated by action of some metallic impurities which are known to act as catalysts in promoting oxi-

dation changes. It is also known that phosphatides form addition compounds with the salts of heavy metals and even calcium is suspect in this instance.—

Paul I. Smith.



"With each three ounce bottle we're giving away these beautiful simulated pearls."



Dr. William Montagna

## Dr. William Montagna Receives Special Award at S. C. C. Meeting

Dr. William Montagna, professor of biology at Brown University received the 1958 award of \$1,000 in recognition of his fundamental research, publication and elucidation of the biology of the skin and its appendages at the mid year meeting of the Society of Cosmetic Chemists in New York, June 4.

The award was presented at the luncheon. Dr. Albert M. Kligman, professor of dermatology at the University of Pennsylvania outlined Dr. Montagna's contribution to the basic understanding of the skin and the growth patterns of the skin's appendages. President James H. Baker then presented the scroll and the check constituting the award.

Dr. Montagna's publication "The Structure and Function of the Skin" appeared in 1956. His overall publications include over 60 papers and he is now writing a text bok of compartive anatomy. In 1957 he organized a symposium in London at the Royal College of Surgeons on the "Biology of Hair Growth" and a book of the same title shortly to be published, was edited by him.

H. J. Amsterdam was chairman of the Society's special award committee and Dr. L. D. Apperson was chairman of the literature review committee. A total of fourteen investigators were nominated for the award and their work was reviewed by the Special Awards Committee before Dr. Montagna was selected for the honor.

Seven technical papers were presented at the morning and afternoon sessions as follows:

"Percutaneous Absorption of Vitamin A," Dr. Albert E. Sobel, Jewish Hospital.

"Effect of Metabolite Analogs on the Formation of Tissue Components," Dr. H. George Mandel, Geo. Wash-

ington University.
"The Present Role of Detergents in Toilet Bar Manu-

facture," John McCutcheon.

"The Use of Infra Red Spectroscopy in Studying the Composition of Essential Oils," Dr. C. L. Teitelbaum, Battelle Memorial Institute.

"Skin Problems of The Older Woman," Dr. Alice E.

"The Role of Ultraviolet Absorbers in Cosmetics," Dr. F. E. Woodward, Antara Chemicals Division.

"Nitrogen as Propellent in Pressure Packaging," H. R. Shepherd.

Abstracts of some of the papers follow.

### Percutaneous Absorption of Vitamin A

These studies were undertaken to determine whether vitamin A can be absorbed across the skin. Percutaneous absorption would be valuable in those cases where high doses of vitamin A are required to remedy skin conditions, and also where oral administration is impractical due to gastro-enterological problems. Vitamin A in various media was applied to the skin of normal, and vitamin A deficient rats. Precautions were taken to prevent the animals from reaching the vitamin, which was placed just behind the head, and carefully covered. Criteria of absorption were: vitamin A content of blood, liver and kidneys and histological changes of the skin.

It was shown that vitamin A is absorbed across the skin, and this absorption, dependend on the medium, resulted in 1/10th to 15th as much liver storage as absorption from corresponding preparations administered orally. The amount of vitamin A storage in the liver was related to the amount of the vitamin applied to the skin; the normal rat stored about twice as much as the "A"-deficient rat from the same quantity of "A' in the application. The media employed influenced the absorption considerably; particularly noteworthy was the relatively poor absorption from cotton seed oil compared to corn oil. Vitamin E, may be a factor in this difference, as vitamin E, added to purified vitamin Efree corn oil, caused increased storage, in both oral and topical application. Absorption from a lanolin containing preparation, "Desitin," was close to that ob-served in corn oil. Minor histological changes in the skin resulted from the media, with the exception of the menstruum contained "Desitin."

Several weeks elapsed between generalized vitamin A deficiency and the appearance of skin changes. There was also a time-lag between topical application of vitamin A and restoration of the skin. Although xerophthalmia disappeared and weight gain took place shortly after commencement of topical treatment with the

vitamin, restoration of the skin lagged four weeks behind, and was apparent only at the site of application. These findings indicate that vitamin A is necessary for the normal reproduction of the basal cells of the skin. When the basal cells are deprived of vitamin A, the derived cells are "A"-deficient; when the basal cells are exposed to vitamin A, the derived cells produce normal skin. These findings also indicate that topical application of vitamin A affects restoration of skin directly rather than through absorption and re-circulation of "A."

Further studies are necessary to determine whether these observations are applicable to other species, particularly that of humans.—Abstract of S.C.C. paper by Albert E. Sobel.

### Natural Gums in Cosmetic Formulations

The usefulness of natural gums for cosmetic formulations can be extended by utilizing such gums under optimum conditions. For this purpose the effect of such factors as pH, temperature, complexing agents, additives, methods of preparing the solution of dispersion and the possible interaction of the gum with preservatives must be considered or elucidated.

The choice of a suitable gum for a given cosmetic product must be made in the light of the variations that occur in natural gums. Differences in polymer size and in residual impurities, for instance result in distinct differences in stability and thickening capacity.

A series of studies of tragacanth gum is presented to demonstrate the influence of some of the above cited variables on the properties of a natural gum.—Abstract of S.C.C. paper by Gerhard Levy.

### The Present Role of Detergents in Toilet Bar Manufacture

Detergent bar manufacture is not a recent innovation—acceptable bars were used by the Navy during World War II. The biggest problems to overcome in formulating a good bar are:

(1) The defatting action on the skin

(2) The lack of free rinsability

which results in a disagreeable feeling. Some of the methods of overcoming these factors are discussed, and specifications of an ideal synthetic bar are given.

Raw materials such as the alkyl sulfonates, alkyl methyl taurides; extenders such as soap; and various binders such as starch, gums and polyethylene glycols are discussed. Possibilities for future work are also described.—Abstract of S.C.C. paper by John W. Mc-Cutcheon.

# The Use of Infrared Spectroscopy in Studying the Composition of Essential Oils

Infrared spectroscopy has proven to be one of a number of physico-chemical techniques useful in studying the composition of essential oils. Its use involves the combined efforts of chemist, spectroscopist, and perfumer or flavorist, and requires the development of a library of reference spectra. It can be used to guide the separation procedure, identify the isolates, make quantitative estimates of the components, and provide structural information on compounds not in the spectral reference library.—Abstract of S.C.C. paper by C. L. Teitelbaum.

### The Dermatologist, the Older Woman, and Cosmetics

This paper presents an up-to-date review of changes

in the skin as it ages, with emphasis on the skin of women. It touches upon endocrine, nutritional, congenital, and psychological influences on the skin. Following a brief review of the type of care which aging skins need, there are suggestions for what the author feels could be developed in the cosmetic fields. Photographs were presented to illustrate some of the points covered.—Abstract by S.C.C. paper by Alice E. Palmer.

### Ultraviolet Light Absorbs in Cosmetic Applications

There are many chemicals which absorb ultraviolet light, but only a few are of economic importance because of their light absorption properties per se. This paper describes the commercial products now available and gives briefly their physical and light absorption properties. These products perform by absorbing light in the region of 330-400 mu and transforming this absorbed (and destructive) energy into heat.

Experimental data is given which illustrates some actual and potential uses for ultraviolet light absorbers in the cosmetic industry, for example, the protection of coloring and perfumes. The use of sun screen agents in the control of sunburn from a cosmetic and dermatological viewpoint is only mentioned briefly.—Abstract of S.C.C. paper by F. E. Woodward.

### Nitrogen and Other Inert Gases as Propellent in Pressurized Packaging

This paper covered the history of inert gas pressurized packages. Various laboratory data were presented covering the solubility of the different inert gases. Product limitations, applications and potentials were discussed. In addition, the production aspects of nitrogen filling will be mentioned.—Abstract of S.C.C. paper by Samuel Prussin.

A merican business has wrestled with the "hard sell" in only two short periods since the start of World War II—1948 to 1949 and 1953 to 1954. Now in a business climate of cutbacks in inventories and capital spending many companies are in the third "hard sell" period, Dun's Review points out. In an article in the Review Thomas Kenny offers some suggestions for strengthening sales in a sagging market. From the results of a nation wide survey Mr. Kenny prepared the following eight point checklist of specific sales stimulants:

1. Make everyone a salesman

2. Seek out new distribution channels

3. Conduct special promotions

4. Move into growing markets

5. Develop new products

6. Keep advertising strong

7. Turn the slowdown to your advantage

8. Stimulate personal selling

The list does not exhaust the possibilities available to management. Such miscellaneous measures as the following are also suggested: Eliminate slow moving products; put out new products earlier than usual; create better packaging; liberalize credit terms, keep salesmen better informed; and absorb freight charges and trim prices.

According to the U. S. Census preliminary estimates for 1957 the population last year grew to a record 172,800,000, an increase by about three million for the second year in a row. Last year 4,302,000 babies arrived, more than in any year on record. Deaths last year were 1,638,000, up from 1,568,000 in 1956.



Pierre Harang, T.G.A. President

# T. G. A. Busy with Conventions—Scientific Section Well Attended

**B** ecause the Toilet Goods Assn. scheduled its 23rd. annual convention in Poland Springs, Maine, June 25-28, the activities usually concentrated in a single meeting in New York, were divided into three parts.

#### Presentation of Awards

The first and only general meeting to be held in New York was the luncheon meeting May 22 when the Charles S. Welch Memorial Awards were presented to winning students of the New York University Graduate School of Business Administration. This was held in the Waldorf Astoria. the first, second and third prize winners respectively were: Mrs. M. K. Hansen, James W. Taylor and Miss Marion Klein. Honorable mention was awarded to Edward K. Gill, J. R. McGovern and B. J. Loret. The subject of the contest was "The Attitude of College Men Towards the Use and Purchase of Certain Toiletries Designed for Men," and

covered deodorants, men's cologne, after shave and pre-shave preparations. Charles H. Oestreich, president of the Lander Co. and chairman of the awards committee presented the prizes after he was introduced by Pierre Harang, president of the association. Mr. Oestreich outlined the purpose of the awards and gave a brief sketch of the history of the awards. He also pointed out the value of the work to the industry.

#### Scientific Section Meeting

As usual the Scientific Section held a well attended meeting in The Waldorf-Astoria hotel, June 5. The papers presented were not only well prepared but were especially timely. They were:

Shelf and Accelerated Testing of Perfume Compounds in Finished Cosmetic Preparations by Victor Di Giacomo and Walter Wynne, Givaudan-Delawanna, Inc.

A Study of the Penetration of Aluminum Salts into

#### CHARLES S. WELCH MEMORIAL AWARDS PRESENTATION



Dais at T.G.A. Charles S. Welch memorial awards presentation: Seated left to right, Dr. Arnold Corbin, New York University professor; Pierre Harang, president of the T.G.A.; Charles H. Oestreich, chairman of the awards committee; Mrs. M. K. Hansen, winner of first prize. Standing left to right, Dr. Paul Olsen, director of marketing research, Drug Trade News; and winning students: B. J. Loret, E. K. Gill, James W. Taylor, J. B. McGovern and Miss Marion Klein

Excised Human Skin by Irvin H. Blank, Edith Gould and John L. Jones, Jr. The first two authors are affiliated with the Department of Dermatology, Harvard Medical School and Massachusetts General Hospital. The remaining author is affiliated with the Recheis Co., Inc.

Establishing the Safety of Fluoride Dentifrices by S. L. Cooper, The Procter & Gamble Co.

Principles for Evaluation of the Safety of Cosmetics from the Standpoint of Inhalation by Henry J. Horn, M.D., Hazleton Laboratories.

Lanolin Derivatives as Solubilizers by Lester I. Conrad, Kalmen Motiuk and Henry Maso, Research Laboratories, American Cholesterol Products, Inc.

Antiseptics versus Antibiotics for the Control of Skin Bacteria by Dr. Samuel M. Peck and Dr. Irwin Kantor.

New Approaches to the Study of Human Horny Layer by Peter Flesch, Department of Dermatology, University Hospital, University of Pennsylvania.

Pressure Packaging with Nitrogen by Morris J. Root, Technical Director, G. Barr & Co.

Dr. Emil G. Klarmann, chairman, presided at the technical sessions and at the luncheon with his usual skill. At the luncheon William L. Jaeger, president of the Cosmetic Industry Buyers and Suppliers Assn. presented the annual CIBS award of \$500 jointly to Dr. Donald H. Powers and Charles Fox for their paper "A Study of the Effect of Cosmetic Ingredients, Creams and Lotions on the Rate of Moisture Loss from the Skin," which was voted the most beneficial paper submitted in the past year to the Scientific Section of the T. G. A.

#### Poland Springs, Maine, Meeting

For the first time in 31 years the association is to hold its annual convention outside the city of New York. Jack Mohr, chairman of the program committee has announced the tentative program for the meeting to be held in the Poland Spring House. The association has sent out to members directions for reaching Poland Springs by rail, by airplane and by automobile, a service much appreciated. The dates set for the convention are from June 25 to June 28.

The first business meeting will be held at 10 a.m. June 26. It will consist of a brief welcoming address by Gov. Edmund S. Muskie of Maine; the report of President Pierre Harang; an address by Dr. George P. Larrick, U. S. Commissioner of Food and Drugs; and an address by Earl W. Linter, chief counsel of the Federal Trade Commission. At the close of the meeting the election of new officers will take place. On the afternoon of June 26 there will be a brief meeting for manufacturers of finished goods only. It will consist of a general discussion of store relations. No fixed features have been scheduled for this meeting.

The following day, June 27 will be devoted to the golf tournament and no business meetings have been scheduled. The ladies golf tournament will take place June 26.

The final business meeting will be held June 28 at 10 a.m. A panel discussion on distribution and merchandising has been arranged with Robert E. Hilbrant, vice president of the Colgate-Palmolive Co. as moderator. Among the panelists will be Marshall Chapman, A. C. Nielson Co.; Edward A. Loring, Gilman Brothers Inc.; Richard Lockman, Emil Mogul Co. and others whose names are to be announced. The new officers of the association will be installed at this meeting. The new president will preside at the closing dinner Saturday evening, June 28.

Abstracts of some Scientific Section papers follow:

#### Germicides Versus Antibiotics and Chemotherapeutics In the Control of Resistant Staphlococcal Infections of the Skin

By Samuel M. Peck, M.D. and Irvin Kantor, M.D.

- 22 cases with pustular acne or pyodermas were studied from the viewpoint of sensitivity to commonly used antibiotics and chemotherapeutic agents of organisms isolated from the lesions. (2 patients had repeat cultures, resulting in a total of 24 cultures).
- In all but 2 of the cases, a staphylococcus was isolated from the skin lesion. While this is no absolute proof of pathogenicity, it is of clinical interest in view of the reports on increase of staphylococal infections both in the hospital and in the general community.
- 3. Employing the disk method, about 1/2 of the organisms isolated were found to be penicillin and neomycin resistant. Since the latter antibiotic is commonly found in topical ointments, this finding is of practical importance. In many instances the same organisms showed resistance to from 1 to 7 of the antibiotics tested.
- In practically all of the cases, sulfonamides had no effect in inhibiting bacterial growth.
- 5. In a small series of cases antiseptics such as hexachlorophene and benzalkonium proved as effective as the antibiotics and significantly there was no resistance encountered. However, some of the proprietary acne remedies and antiseptic creams sold over the counter showed such small zones of inhibition that for practical purposes they were worthless as antibacterial agents.
- 6. In the limited study carried out, it appears that for the local treatment of minor infections, it is better to use the commonly available, effective antiseptics rather than the antibiotics, whether singly or in combination. It is important to use an effective concentration of an antiseptic such as hexachlorophene.
- 7. If antiseptics instead of antibiotics are used for the relatively minor skin infections, then our few remaining antibiotics, effective against staphylococcus, can be employed to greater advantage in the more serious systemic diseases.

#### A Study of the Penetration of Aluminum Salts Into Excised Human Skin

#### J. L. Jones, Jr., Irvin H. Blank, Ph.D., and E. Gould, B.S.

Any substance which penetrates to the area of the sweat glands following local application to the cutaneous surface will be found in the dermal area. It is possible to hold solutions of aluminum salts in contact with the cutaneous surface of pieces of excised human skin for any desired length of time, then to separate the epidermis from the dermis and determine the amount of aluminum which has penetrated to the dermis. The quantitative methods employed in the experiments reported here cannot measure less than 6  $\mu$  g per cm² of dermis. With the techniques employed, we have rarely found any measurable quantity of aluminum in the dermis.

Very little aluminum salt was found to penetrate into the inner part of the stratum corneum of normal skin or into the dermis of pieces of skin in which the main barrier against penetration had been mechanically removed. Apparently the combination of aluminum with the proteins in the skin holds the aluminum in the outer part of the stratum corneum and prevents penetration to the dermal area.

Since the data reported here seem to show that so little aluminum reaches the area of the dermis, any antiperspirant action which results from the local application of aqueous solutions of aluminum salts is unlikely to be due to alteration of the physiological activity of the sweat glands by the aluminum salts.

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#### Abstract—Pressurized Packages for Toilet Goods

#### By Morris J. Root

Aerosol packaging, which has had such a marked impact on toilet goods articles, may soon become just a stepping stone to a vastly larger field, which we can call pressure packaging. A pressure package is a self-dispensing package and differs from the aerosol package in that the propellent need not be a liquefied gas, but can be a compressed gas. The forerunner of this type of packaging was whipped cream, but only recently has it been adapted to toilet goods with the introduction of pressurized toothpaste. Nitrogen, because of its economy and availability, will be the most commonly used gas although for special properties, other gases such as carbon dioxide, nitrous oxide and argon can be used. Products can be dispensed as sprays, foams, or liquids.

Valves for viscous products have had to be modified as to dip tube size and orifice openings. For dispensing non-aerated products, a suitable spout also had to be produced. Conventional valves and actuators can be used for many pressurized packages.

Special manufacturing lines had to be set up to manufacture the pressurized package. Although some of the equipment, such as can coders, can crimpers, and the water bath, can be identical to that used for aerosol packages, other equipment, such as pressure gassers and testers, had to be designed and built. All pressurized packages are pressure filled; that is, the gas is forced into the container through the valve.

Most viscous products now packaged in bottles or tubes can be satisfactorily dispensed in a pressurized package. Flow characteristics of the product must be known to eliminate possibility of gas cavitation, which will result in malfunction.

Vapor phase chromatography adapts itself very readily to analyses of the gas phase and the determination of effectiveness of oxygen removal by purging.

Pressurized packages will accelerate the development and production in this country of aluminum containers in the six-ounce and larger sizes. Eventually, glass containers will be used for pressurized products.

In the very near future, pressurized packages containing hand lotions, cleansing creams, shampoos, and hair dress will appear on the market.

#### Solubilization by Means of Lanolin Derivatives

#### Lester I. Conrad, Kalmen Motiuk, Henry F. Maso

Solubilization is the name given to a phenomenon which brings into apparent solution materials that are otherwise insoluble in a given liquid medium.

A series of lanolin-derived solubilizers has been prepared and investigated for solubilization activity. These products are ethylene oxide adducts of the ether and ester-ether types. A technique for solubilization is described and the importance of a systematic empirical approach stressed. The most effective solubilizers are the 16 mol ethylene oxide ether and the acetylated ester-ethers containing 9 to 77 mols of ethylene oxide. These lanolin-derived products are excellent

solubilizers for water-insoluble lanolin materials such as acetylated lanoline, acetylated lanolin alcohols, liquid lanolin, anolin alcohol linoleate and lanolin itself. The systems solubilized have an unusually high emolient level since both solubilizer and solubilizate are emollients in their own right. These products are also of great value as solubilizers for a host of other waterinsoluble materials. Examples of solubilized products which are potentially useful in cosmetic and pharmaceutical formulations are given.

This study has demonstrated that lanolin-derived solubilizers are important new tools in the hands of the cosmetic and pharmaceutical chemist for the development of valuable new consumer products.

#### New Approaches to the Study of Human Horny Layer

#### Peter Flesch, M.D., Ph.D.

This study deals with several methods for determining the ability of various chemical agents to disperse the horny layer.

I. In one set of experiments, we measured the rates of flow of various oils through a standardized column of pulverized horny scales. The main findings were as follows:

 The flow rates depend on the type of oil tested, regardless of the nature of the scales.

Compared with normal specimens, the flow rates through pathologic scales were extremely prolonged.

3. Agents which disperse the horny layer, greatly accelerate the rates of flow. Among these agents we tested 75% lithium bromide, 10% urea, 0.2% allantoin, 0.2% aluminum chlorhydroxy allantoinate solutions and detergents. The order of activity was: lithium bromide, allantoin, urea, aluminum chlorhydroxy allantoinate. Detergents retarded the flow of oils through the powdered horny layer.

II. Microscopic studies of scales after immersion into water, urea, allantoin and aluminum chlorhydroxy allantoinate also revealed the dispersing ability of these substances.

III. In chemical studies we estimated the amounts of extractable sulfhydryl and free alpha amino groups. With the dispersion of scales, the concentration of the extracted sulfhydryl groups increase. These groups are bound to the soluble proteins in the horny layer and may be estimated after dispersion of the scales. By such a test, the Keratin dispersing effect of allantoin was also ascertained. On the other hand, the amounts of extractable free amino groups cannot be used as an index of the de-segregation of the horny layer. Water alone extracts the maximum amounts of these groups and protein dispersants do not increase the quantities of extractable amino nitrogen.

On the basis of the present and previous work the theory is advanced that in "chapped," "dry" and "scaly" skin we deal with two independent features which may or may not appear together: 1. Dryness, which is due to deficiency in the water-soluble hygroscopic components of the horny layer; and 2. stickiness, which is probably caused by the persistence of a cementing matrix between the horny cells, resulting in the formation of visible scales which adhere to the skin surface. The nature of the hygroscopic components is unknown; our work indicates that in some way they are related to free amino groups. The hypothetical cementing matrix is equally obscure; some of our recent experiments suggest that epidermal mucopolysaccharides may play a role.

## F. E. M. A. Learns of New Era in Vanilla Industry

The untimely death of President Myron Hess on the eve of the 49th annual meeting of the Flavoring Extract Manufacturers Assn. over which he was to preside was not only a shock to the members but it put a note of sadness into the proceedings never before experienced. The meeting took place in Chicago, May 18-21

The outstanding features of the meeting was the technical symposium on food additives. Dr. Richard Hall presided and presented the report of the Food Additives Committee. He was followed by Dr. Bernard Oser who spoke on technical aspects of flavors as food additives. Joseph Becker took as his theme the subject of chemicals in foods from a legal angle and Howard Spencer gave a paper on testing for toxicity. A question and answer period followed which proved to be a worth while discussion from every viewpoint.

Another outstanding feature was a special meeting on the afternoon of the first day of special interest to members supplying the ice cream industry. This took the form of a discussion of flavoring ingredients to be contained in frozen desserts and related products as provided in proposed definitions and standards of identity for frozen desserts and related products. The meeting was held primarily to enable the members to make recommendations to the board of governors in the formulation of a plan or policy in the protection of the interests of the members of the association.

A third matter of special interest was created by the address of Ray C. Schlotterer, secretary of the Vanilla Bean Assn. He pointed out that the long awaited standards for the vanilla industry will soon be adopted by the Food & Drug Administration; and on them, he pointed out, will be built an entire new era for the vanilla business. This is so because the standards will force food and confectionery manufacturers to clarify their labeling and in this way give consumers a better opportunity to choose between pure vanilla flavors and synthetics.

"We are not afraid of our future position as importers of a natural product that has no peer as the No. 1 American flavor. We believe that the assurance that a label means what it says will spark the development of new plantations the world over and means that intelligent fair practice will replace unfair business procedures." He pointed out that in the past regulatory authorities have been busy with outright adulteration and now they are focusing their attention on sophisticated adulteration. That will put emphasis on definitions for standards of identity and the bone of the industry's contention—labeling.

"The flavoring industry has long deferred the research necessary for setting up the regulations required under the present food and drug law, and it is going to face future 'dilemmas' when finally adopted.

"Product labeling has either been ignored, or one has merely winked an eye at its requirements in the past. No one is saying that any other flavor which simulates 'vanilla' is impure, adulterated or anything else; merely that a product using the name vanilla, be made from 'pure vanilla' flavor.

"If you want to use something else, instead of 'pure vanilla,' this is a free country—use it, but label your brain-child to show that this is the case," Mr. Schlotterer continued.

In the new era which he predicts, Mr. Schlotterer said the importer will have to do his part to accelerate the production of more vanilla.

"He must see that the supply is increased in answer to the demands made by federal regulations. We know that everyone is not going to use 'pure vanilla,' that 'imitation vanilla' labelled as such will be on the increase but at least the label will give not only a true picture but a fair picture of the bottle or package contents," he added.

E. N. Heinz Jr. was elected president for the ensuing year.

# Hair Sprays No. 1 Product in Aerosol Sales Specialty Manufacturers are Told

About 24% of the total sales of products packed in aerosols in 1957 were hair sprays according to figures given at the May mid year meeting of the Chemical Specialties Manufacturers Assn. in Cincinnati. Hair sprays accounted for 94,431,000 units of the 390,000,-000 total for all aerosol packed products. This put hair sprays in the No. 1 position. Aerosol shaving creams were in the No. 2 position with 51,000,000 units. In the No. 3 spot were room deodorants with 42,000,000 units, practically tying the sale of insecticides which hitherto have been the leader in sales. Insecticide units totalled 41,607,000. Household aerosol products, including room deodorants totalled over 70,000,000 units. Personal products of which hair sprays and shaving creams are the chief products reached a new high of 175,000,000 units. Colognes and perfumes accounted for 17,881,000 units.

Official production figures of the association give the following production figures for the past five years: 1957, 390,000,000 units; 1956, 320,000,000 units; 1955, 240,000,000 units; 1954, 185,000,000 units and 1953, 140,000,000 units. The total retail value of all aerosol packed products sold in 1957 was estimated at \$380,000,000.

The Aerosol Division of the Association met on two afternoons. W. Earl Graham was division chairman. Reports were given by Frederick C. Lodes, Norman Odell, A. E. Schober, Eugene Lesher, G. L. Hays and D. W. Riester. Among the papers presented were "Instrumentation for the Aerosol Industry" by William B. Leighton; "The Past, Present and Future of Labeling Pressurized Containers" by Robert L. Ackerly; and "P.V.P.—Medical Review of Its Inhalation Experiences in Industry," by Morris V. Shelanski. W. E. Baulieu and Alfred Weed presided at the second session.

Four papers were read at the meeting of the Soap, Detergents and Sanitary Chemical Products division. An illustrated lecture in color motion pictures by

Dr. Ernest Guenther on "Essential Oils of Africa" was one of the highlights of the meeting.

The next general meeting of the association will be held in the Commodore Hotel, New York, December 8, 9 and 10.

It has been found by retailers that the less personal selling on the retail floor—and that is both the cause and result of self service selling—the more vital it is to have effective silent selling on the floor. That is one of the great jobs of the package—but it also includes signs and cards.—E. B. Weiss.

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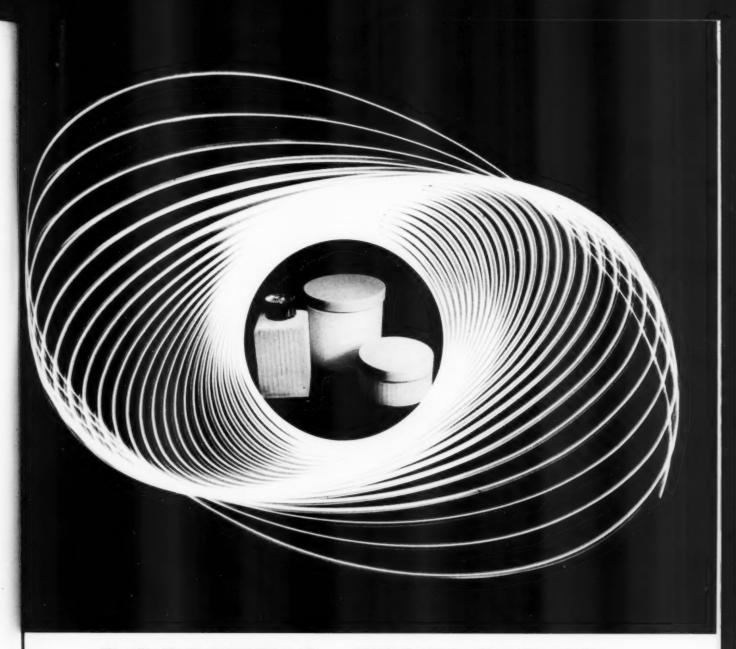
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# **COSMETIC EMULSIONS**

Most Efficient Practice Explained By Experts

"Basic Emulsion Technology"

By Phyllis J. Carter

"Aerosol Emulsions"
By Morris Root

"Effect of Perfume Oils on Emulsions"

By Walter Wynne

"Triethanolamine Emulsions" By Dr. Paul G. I. Lauffer

"Emulsifying Properties of Lanolin Derivatives" By Lester I. Conrad

"The Mechanical Treatment of Emulsified Products" By G. Kompson-Jones



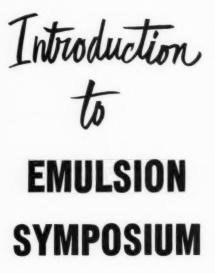




Photo Courtesy of Elizabeth Arden

#### MAISON G. DE NAVARRE

Galen is most often credited with being the father of modern cold cream and through it a long line of emulsified cosmetic products.

Emulsion practice has come a long way since the days of Galen. Indeed, it is a fine science today. To bring the subject up to date, one must not overlook the use of aerosol emulsions, a facet of that mushrooming industry that will take on greater importance as time goes by.

In this presentation of several aspects of emulsion technology, a group of experts in each of their respective fields has contributed basic and up to date knowledge on emulsion technology.

Originally, emulsions were used as cleansers or emollients. Today we have emulsified aerosols, antiperspirants, deodorants, cleansers, depilatories, emollients, hand preparations, make up, nail preparations, rinses, shampoos, suntan products and waving preparations to name

Inasmuch as nothing further has developed on the effect of aromatics on emulsions, we repeat an article originally published in the Givaudanian and written by Walter Wynne. This makes the section complete.

In addition, fundamental formulations published by Dr. Paul Lauffer in 1930, are repeated in part because they are as good today as they were then. They are added to Dr. Lauffer's present contribution.

Morris Root's contribution on the use of emulsified areosols comes from the pen of a man well posted and thoroughly acquainted with his subject.

G. Kempson-Jones is perhaps not as well known in the United States as he is in Europe. For years he has made contributions on various phases of cosmetic manufacture and production. We think his treatment is illuminating and concise.

Phyllis Carter is known to the American Perfumer audience for work on novel emulsifiers and their applications in cosmetic products. Her discussion is made in rather "easy to follow" language to be of the most value to all.

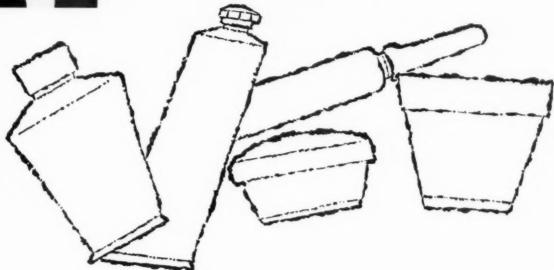
Adding to the knowledge of the use of lanolin derivatives in cosmetic emulsions is a stimulating paper from the pen of Lester I. Conrad, who knows lanolin inside out. He is also inventor or co-inventor of several U. S. and foreign patents on lanolin derivatives.

I hope our readers find these articles as useful as I did in prepublication reading.



# BASIC EMULSION TECHNOLOGY





PHYLLIS J. CARTER\*

Miss Carter is group leader in charge of cosmetics and pharmaceuticals in the Product Development Department of the Atlas Powder Co. where she has worked for 11 years. Prior to that in July 1946 Miss Carter worked for ten months in the analytical section of the company's pilot plant. This was just ofter she obtained her Bachelor of Science degree from Albright College in 1946. Miss Carter is an active member of the Society of Cosmetic Chemists and in 1955 was co-author of a paper presented before the Toilet Goods Assn. which was awarded the CIBS prize.

A cosmetic chemist is faced daily with the complex problems of emulsification. Cosmetic emulsions are especially perplexing because they often behave in a manner which cannot be predicted from the general facts now known about emulsions. Accordingly, it is important for the cosmetic chemist to have a general background of all facets of emulsion technology.

#### Reasons for Use of Emulsions

Cosmetics are formulated as emulsions for a variety of reasons. One is that oily materials can be incorporated into non-oily systems thereby improving application properties. Another occasion for their use is that the cost of a final product can be reduced, perhaps by the elimination of solvents. Still another, is that nor-

mally incompatible materials can be used in the same product. Often, an ingredient in emulsion form penetrates the skin more readily than when used alone. An emulsified system sometimes offers a means of obtaining added cleansing action. Emulsion systems also aid in carrying water, an excellent softener, to the skin.

#### **Definitions**

An emulsion is an intimate mixture of two immiscible liquids, one of which is present as globules in the other. The portion which is broken into globules is known as the internal, discontinuous, or dispersed phase. The liquid which surrounds these globules is known as the external or continuous phase. The boundary of contact of the two liquids, that is the surface common to both, is known as the interface.

An emulsion may be prepared solely by mechanical means, but good stability is usually not achieved. In order to obtain ease of formation and good stability, a third material known as an *emulsifier* is introduced. Most emulsifiers belong to the broad class of materials known as surface active agents or *surfactante*, materials which alter the surface properties of other materials with which they come in contact. If a surfactant is used to prepare a clear emulsion, it is known as a *solubilizing agent*. When a surface active agent is used to remove soil from fibers or surfaces it is called a *detergent*.

#### PROPERTIES OF EMULSIONS

The properties of emulsions are of prime importance to cosmetic manufacturers, because the quality of the emulsion systems determines sales appeal of the cosmetic products. The properties of any emulsion system

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<sup>\*</sup> Product Development Dept., Atlas Powder Co., Wilmington, Del.

are dependent on the chemical and physical properties of the internal and external phases, the ratio of the two phases, the type and concentration of emulsifier used, the order of addition of ingredients, the type of equipment used in preparing the emulsion, and the ionic charges on the emulsion particles.

#### **Emulsion Type**

An emulsion consists of two phases, an internal, discontinuous, or dispersed phase within a second phase known as the external or continuous phase. If the emulsion consists of oil as the internal phase dispersed in water as the external phase, the emulsion is said to be of the oil-in-water (O/W) type. When the water phase is the internal phase, with the oil surrounding it as the external or continuous phase, the product is said to be a water-in-oil (W/O) emulsion. Occasionally an emulsion has no well defined internal and external phases, that is each phase contains droplets of the other phase. In this case the emulsion is said to be a mixed, dual, or polyphase emulsion.

The type of emulsion formed is dependent in large part on the ratio of oil to water in the system, the method of agitation, and the surfactant choice.

#### Dispersibility

The dispersibility of an emulsion is dependent on the emulsion type. If the external phase is water, the emulsion can be diluted with aqueous solvents. If the external phase is oil, the emulsion can be diluted with oily materials. Dispersibility is useful in determining emulsion type.

#### Conductivity

The conductivity of an emulsion is dependent on the conductivity of the external phase. Hence, an oil-in-water emulsion conducts electricity well; a water-in-oil emulsion is a feeble conductor. A conductivity test is an excellent means of identifying emulsion type,

#### Viscosity

In general, the viscosity of an emulsion is dependent on the viscosity of the external phase, the ratio of the external phase to the internal phase, and to a lesser extent, on the particle size of the dispersed droplets. In many cosmetic emulsions, the viscosity is also dependent to some extent on the melting point of the ingredients in the internal phase. It may also depend on the type and concentration of emulsifier.

The viscosity of an emulsion is usually similar to that of the external phase, when that phase constitutes the major part of the product. When the internal phase is increased in concentration the viscosity of the product is increased, and when the volume of internal phase is greater than that of the external phase apparent viscosity increases markedly. This phenomenon is caused by particle crowding in the emulsion. Theoretically, only 74% of the total emulsion volume can be occupied by the internal phase if the globules are of uniform spherical shape. When the internal phase is extremely high, the inner phase particles become quite distorted, and under these conditions particle size and particle charges have a greater effect on emulsion viscosity.

Emulsions obey Stokes' Law of Sedimentation. One of the factors involved in sedimentation, although not the most important one, is the viscosity of the continuous phase of the emulsion. A high viscosity reduces the tendency of the emulsion to separate.

#### Particle Size

Particle size is usually expressed as the diameter of

the globules in the internal phase. If the size is not uniform, the particle size occurring most frequently is used to denote the particle size of the emulsion. The values of the smallest and largest particles are said to be the range of particle sizes present. Emulsions containing particles which are small in diameter are said to be fine emulsions; those containing large globules are coarse emulsions.

The particle size of an emulsion is dependent on the type and quantity of emulsifier, the amount of work done to prepare the emulsion, and the order of addition of ingredients. Most commercially available emulsions have a particle size of 0.5 to 2.5 microns. Fine, uniform particle size in an emulsion is usually an indication of good stability. The particle size of an emulsion can be estimated from its appearance using Table I.

# Table I(1) Estimation of Particle Size by Appearance

Particle Size Greater than 1 micron 0.1 to 1 micron 0.05-0.1 micron

Appearance Milky white emulsion Blue white emulsion Gray semi-transparent emulsion

Transparent emulsion

0.05 micron and smaller

#### Particle Charge

The dispersed phase of many emulsions, particularly those made with ionic emulsifiers, exhibits a particle charge which can be determined by electrophoresis. This charge can be caused by dissociation of one of the emulsion ingredients, for example, soap, or in the case of non-ionic emulsions, it might be caused by frictional electricity. In extremely small particle size emulsions, particle charge is of extreme importance in maintaining emulsion stability. In most cosmetic emulsions, however, particle charge is of little consequence in maintaining emulsion stability.

#### pH

In the past few years, the importance of the pH of cosmetic emulsions has become recognized. The skin itself has a pH of 4 to 6, and it tends to work to regain that pH when it is altered by application of cosmetic products of different pH, for example soap type products. In order to aid the skin in maintaining its pH, many cosmetics are purposely adjusted to the pH of the skin.

The pH of an emulsion, like the pH of other systems is a measure of the intensity of its acidity or alkalinity. Soap type emulsions usually have a pH of 8 or more and will separate if brought below a pH of 8. For example emulsion separation will occur if aluminum chlorhydroxide is added to a soap emulsion. Nonionic emulsified products usually have a pH of 5 to 8, although pH can be adjusted from about 3 to 8 without materially affecting their performance. Cationic emulsions range in pH from 3 to 7 and are usually broken if anionic materials such as soaps or alkyl sulfates are added.

#### Appearance

The appearance of an emulsion is dependent on the ingredients used and the particle size of the emulsion. An emulsion may range from a clear product to extremely fine particle size like a solubilized perfume oil to a milky white product of medium particle size like a baby lotion. Cosmetic creams and lotions may have a mat surface or a pearly appearance, depending on the ingredients used. Pearl is most likely to develop in products containing stearic acid, cetyl alcohol, stearyl alcohol, or some of their derivatives.

#### **Application Properties**

Naturally, the application properties of an emulsion are related to the ingredient choice and to the emulsion type. Emulsions based on mineral oil are likely to form an oily film on the skin; emulsions based on fatty alcohols or fatty acids usually form a dry film on the skin. Beeswax creams or lotions are likely to be tacky. Products containing large quantities of paraffin are likely to roll when applied to the skin. Polyols included in a cosmetic at high concentrations often make a cream or lotion feel moist on the skin. Oil-in-water emulsions in general are less oily than water-in-oil emulsions.

#### Irritation Potential

The likelihood of irritation from an emulsified product is governed by the ingredient choice. Usually if the ingredients themselves are non-irritating to the skin and eyes, the completed product is non-irritating, but occasionally the whole is more irritating than its parts, and for this reason each finished product should be tested for irritation properties.

#### Stability

Stability of emulsions is evidenced by retention of the original appearance, viscosity, and odor under shipping and shelf life conditions. Poor stability, except for lack of odor stability, is generally caused by coalescence of the dispersed particles. The rate of coalescence is dependent on the type and concentration of emulsifier, the viscosity of the emulsion and its component phases, the size of the dispersed globules, the charge on the particles, and the storage conditions to which the emulsion is subjected.

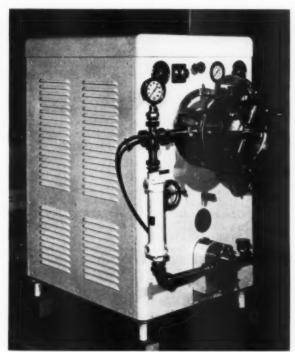
#### PROPERTIES OF EMULSIFIERS

#### **Emulsifier Type**

Emulsifiers may be classified according to their ionizing characteristics into ionic and nonionic types, the ionic type being further subdivided into anionic and cationic surfactants. Ionic type emulsifiers are categorized as anionic or cationic in nature according to whether the surface active portion of the molecule is contained in the anion or cation. Such common soaps as sodium or triethanolamine stearate are said to be anionic surfactants because the effective portion of the molecule, the stearate portion, is the anion. Cetyl dimethyl benzyl ammonium chloride, on the other hand, is classed as a cationic surfactant because the surface active portion of the molecule is the cation. Soap free glycerol monostearate, which does not dissociate into ions, is a typical nonionic surfactant.

Still another class exists in which the molecule contains both acid and basic groups. These are the ampholytes, typified by ethylene cycloimido, 1-lauryl, 2-hydroxy ethylene sodium alcoholate, methylene sodium carboxylate or triethanolamine lauryl beta-alanine.

Another means of classifying emulsifiers is by source. In this system, emulsifying agents may be categorized as those derived synthetically, those originating from vegetable sources, and those from animal sources. Sodium lauryl sulfate or polyoxyethylene cetyl alcohol are examples of synthetic emulsifiers. Carboxymethyl cellulose or algin are representative of the vegetable source emulsifiers, while lanolin and beeswax are examples of emulsifiers of animal origin. Emulsifiers such as the vegetable gums, unlike synthetic and animal source emulsifiers are not surface active. They possess emulsifying properties because they are bodying agents and protective colloids.



Votator Viscoblender. Votator Div., The Girdler Co.

Still another means of classifying emulsifiers is by dividing them into two large classes according to their solubility: those that are hydrophilic (water loving) and those that are lipophilic (oil loving). Polyoxyethylene sorbitan monooleate is typical of the hydrophilic class; sorbitan monooleate is a lipophilic emulsifier. One group of emulsifiers which has been omitted in each of the earlier classifications can be included in this group. These are the finely divided solids such as clays, silicates, or metal hydroxides. They are classed as hydrophilic or lipophilic depending on their affinity for water or oil. Bentonite is an example of the hydrophilic type solid.

One other means of grouping emulsifiers is by their chemical family. For example, sodium laurate, sodium palmitate, sodium stearate, and sodium oleate are considered as members of the sodium soap chemical family. Similarly, sodium oleate, potassium oleate, and triethanolamine oleate are a chemical family of oleate soaps. Glycerol monostearate, glycerol distearate, and glycerol tristearate are also a chemical family of glycerol stearate esters. Still another example would be the following group: polyoxyethylene (5) sorbitan monooleate, polyoxyethylene (10) sorbitan monooleate, and polyoxyethylene (20) sorbitan monooleate.

Unfortunately, none of these classifications is all inclusive. However, each has utility under certain circumstances. By far the most widely used emulsifiers for cosmetic use are those in which hydrophilic and lipophilic groupings are responsible for activity and the discussion which follows is limited to this class.

#### **Chemical Reactivity**

It is important in many emulsions to choose an emulsifier which will not react with or be inactivated by the other ingredients present in the formulation. For example a polyoxyethylene fatty alcohol would be used rather than an ester type surfactant as a clouding agent in a highly alkaline ammonium thioglycolate hair waving solution. This choice is made because ether type surfactants will not react in the presence of alkalies whereas esters will saponify.

#### Surface and Interfacial Tension

Emulsifiers which are part of the broad class of surfactants alter the surface tension of liquids in which they are present. The liquid usually used is water. Surface tension data are not usually considered of great importance in the manufacture of cosmetic emulsions.

Emulsifiers also alter the interfacial tension of two immiscible liquids which are in contact and it is this property which is of importance in emulsion manufacture. As the interfacial tension approaches zero, the ease of emulsion formation becomes greater.

#### Hydrophile-Lipophile Balance-HLB

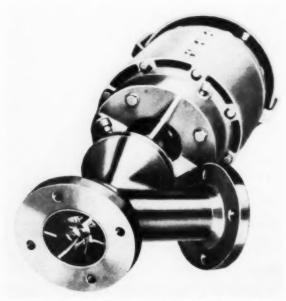
Emulsifiers of the surfactant type contain hydrophilic and lipophilic groups. It is the balance of the size and strength of these groups that is termed HLB or hydrophile-lipophile balance (1.5,0). A strongly lipophilic emulsifier has a low HLB, usually less than 10; a highly hydrophilic emulsifier has a high HLB, usually over 10. The values for some typical cosmetic emulsifiers thus far assigned, shown in Table II, range from one to forty. These values have been determined experimentally or by calculation (2.6).

#### Table II(2,4)

#### Calculated or Determined HLB Values of Some Surfactants Used in Cosmetics

Surfactants Used in Cosmetics	
Chemical Designation	HLB
Sorbitan trioleate	1.8
Sorbitan tristearate	2.1
Propylene glycol monostearate	3.4
Sorbitan sesquioleate	3.7
Glycerol monostearate, non self-emulsifying	3.8
Sorbitan monooleate	4.3
Propylene glycol monolaurate	4.5
Sorbitan monostearate	4.7
Diethylene glycol monostearate	4.7
Glycerol monostearate, self-emulsifying	5.5
Diethylene glycol monolaurate	6.1
Sorbitan monopalmitate	6.7
Sorbitan monolaurate	8.6
Polyoxyethylene (4) lauryl ether	9.5
Polyoxyethylene (4) sorbitan monostearate	9.6
Polyoxyethylene (5) sorbitan monooleate	10.0
Polyoxyethylene (4) sorbitan tristearate	10.5
Polyoxyethylene (4) sorbitan trioleate	11.0
Polyoxyethylene glycol 400 monooleate	11.4
Polyoxyethylene glycol 400 monostearate	11.6
Triethanolamine oleate	12.0
Polyoxyethylene (9) nonyl phenol	13.0
Polyethylene glycol 400 monolaurate	13.1
Polyoxyethylene (4) sorbitan monolaurate	13.3
Polyoxyethylene (20) sorbitan monostearate	14.9
Polyoxyethylene (20) sorbitan monooleate	15.0
Polyoxyethylene (20) stearyl ether	15.3
Polyoxyethylene (20) oleyl ether	15.4
Polyoxyethylene (20) sorbitan monopalmitate	15.6
Polyoxyethylene (20) cetyl ether	15.7
Polyoxyethylene (30) stearate	16.0
Polyoxyethylene (40) stearate	16.9
Sodium oleate	18.0
Polyoxyethylene (100) stearate	18.8
Potassium oleate	20.0
Cetyl ethyl morpholinium ethosulfate	25-30
Sodium lauryl sulfate Approxima	tely 40

One of the most recent advances in the determination of HLB by calculation is a method in which HLB values for surfactants can be calculated from the chemical formula using group numbers, representing chemical groupings in the surfactants<sup>40</sup>.



Eppenbach "Pipe-Line" Homo-Mixer designed to mix without incorporating air into the mixture.

If two surfactants are used as a blend, the HLB of the combination may be found by multiplying the proportion of each surfactant by its HLB value to find its contribution to the total HLB, then adding the two values.

HLB is a useful tool in the preparation of cosmetic emulsions. By using HLB values, surfactant performance can often be predicted, eliminating the need for extensive emulsification tests. Table III shows the usual relationship between HLB and end use of a surfactant.

#### Table III(2)

## Relationship Between HLB and Surfactant End Use

LB value	Applicatio
4- 6	W/O emulsifiers
7- 9	Wetting agents
8-18	O/W emulsifiers
13-15	Detergents
15-18	Solubilizers

#### Solubility

The solubility of surfactants in water can usually be used as a guide in approximating their hyprophile-lipophile balance and their usefulness. While it is by no means an infallible guide the following table can be used in estimating HLB values of many surfactants.

#### Table IV(3)

#### Estimation of HLB by Water Solubility

isomation of Hill by water Son	tomicy	
Action in Water	HLB	Range
Not dispersible		1- 4
Poor dispersibility		3- 6
Milky dispersion after vigorous agitation		6-8
Stable milky dispersion		8-10
Translucent to clear dispersion		10-13
Clear		13+

#### Cloud Point

Surfactants in aqueous solutions often are less soluble hot than cold. During the temperature increase, solutions slowly become hazy and upon further increase in temperature, a point of maximum turbidity occurs. This is known as the cloud point of the surfactant. The HLB (hydrophile-lipophile balance) values of surfactants,

particularly those of the highly hydrophilic non-ionic type, can often be estimated by determining their cloud points. Table V demonstrates the relationship of HLB to cloud point.

Table V<sup>(3)</sup>
The Relationship of HLB to Cloud Point

Cloud Point, C.	HLB Valu
<40	<13
approximately 65	14
approximately 82	15
approximately 94	16
Above boiling point of water	>17

#### Irritation Potential

The irritation potentials of surfactants are of utmost importance in the formulation of cosmetics. Cosmetic emulsifiers should not be irritating to the skin or eyes. In general, the ionic type surfactants show a greater tendency toward irritation than the non-ionic surfactants.

#### FORMULATION AND PREPARATION

#### Choice of Emulsion Type

Emulsion type is an important consideration in the preparation of emulsions for cosmetic use. Oil-in-water emulsions in general are less oily to the touch than water-in-oil emulsions. It is probably because of this one property that most emulsified cosmetic products are oil-in-water emulsions.

Whether an emulsion product should be oil-in-water or water-in-oil depends on its end use. If, for example, it is intended for use as a hand cream or lotion, it should obviously be a product which leaves a non-oily film on the skin. If a product is intended for use as a emollient cream, an extremely oily water-in-oil cream is usually indicated.

#### Composition of Oil Phase

The properties of a cosmetic emulsion depend not only on emulsion type, but also on ingredient choice. The appearance and application properties of oil-in-water emulsions, for example can be varied by altering the oil phase ingredients. If mineral oil is used as the major ingredient, an emulsion which has a glossy appearance and an oily feel will result. If stearic acid or cetyl or stearyl alcohol is used as the major portion of the oil phase, an emulsion with a pearly appearance and nongreasy feel will usually result.

#### Compatibility of Ingredients

The ingredients chosen for inclusion in an emulsion should obviously be compatible. For example, antiperspirant creams containing acid salts such as aluminum sulfate should be formulated with non-ionic surfactants rather than with triethanolamine stearate which would react with the aluminum salt. To illustrate further, ether type surfactants, rather than the ester type, should be used in highly alkaline systems in which esters would saponify.

#### The HLB System (2,3,4)

The HLB system affords a method for surfactant choice which decreases the amount of work necessary in formulating emulsions. Just as each surfactant has an HLB number, each oil phase ingredient has a required HLB indicating the surfactant HLB value needed for good emulsification. The required HLB numbers of some common cosmetic emulsion ingredients are shown in Table VI.

Table VI<sup>(2)</sup>
The Approximate Required HLB of Some Common
Cosmetic Ingredients

	W/O Emulsion (Fluid)	O/W Emulsion (Fluid)	O W Emulsion Solu- bilizing
Acid, stearic	6	15	
Alcohol, cetyl		15	-
Alcohol, stearyl	-	14	-
Lanolin, anhydrous	8	10	-
Oils			
Cottonseed	5	10	_
Essential	Germin	_	15-18
Mineral, heavy	5	12	-
Mineral, light	5	12	15-18
Vitamin			
(with fats or oils)	-	Galeria,	15-18
Vitamin (fat free)		_	15-18
Petrolatum	5	12	_
Vitamins			
Esters	-	_	15-18
Oils (see "Oils" above	e)		
Wax			
Beeswax, white	4	12	_
Microcrystalline		10	-
Paraffin (household)	4	11	-

Suppose a cosmetic formulator wished to prepare an O W lotion, containing 35% mineral oil as the base, 1% lanolin as an emollient, 1% cetyl alcohol as a thickener, and 7% emulsifier. The required HLB of the oil phase can be calculated from Table VI as follows:

					R	eq	uire	ed	HLB
Mineral oil	35	$\frac{35}{37}$	=	94.6%					11.4
Lanolin	1	$\frac{1}{37}$	=	2.7%	2.7	X	10	=	0.3
Cetyl alcohol	_1	$\frac{1}{37}$	=	2.7%	2.7	X	5	=	0.4
	37			imated	required e	H	ILB		12.1

This calculation indicates that emulsifier combinations having HLB values in the range from 11 to 13 will probably provide good emulsification.

If the required HLB value cannot be calculated, it can be determined experimentally by preparing a series of emulsions using a blend of surfactants over a wide HLB range. The surfactant concentration is usually 10% of the oil phase. The point at which best emulsification is obtained is the required HLB value of the oil phase.

After the required HLB value is found, the chemical family which provides the best performance at the required HLB should be determined. For example, stearate surfactants with an HLB of 12 might give better emulsification than oleate esters.

#### Emulsifier Blends

In formulating emulsions it is usually best to use a blend of surfactants as the emulsifier rather than a single surfactant. Usually the more complex the emulsifier system, the better the emulsion stability.

#### Temperature Control

In preparing emulsions it is wise to use jacketed equipment which includes efficient agitators. This type equipment will insure even heating throughout the materials to be heated.



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When waxy ingredients are used in the formula, the oil phase is usually heated to about five or ten degrees above the melting point of the highest melting wax. The two phases to be mixed should be at the same temperature at the time of contact; consequently, the added phase is usually heated about two degrees above the other phase to compensate for cooling during addition. This method, however, is often varied as required for meeting capacities of existing equipment or handling of special materials.

#### Method of Addition

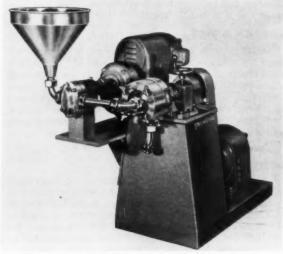
In preparing O/W emulsions, several methods of addition may be chosen. If soap is used as the emulsifier, it is usually prepared in situ. The alkali is mixed with the water phase, and the fatty acid is included in the oil phase. The water phase is then added slowly to the oil phase, using agitation to blend the two. In some cases, the fat phase is added to the water.

When pre-formed emulsifiers are used, they are usually incorporated in the oil phase, although some formulators prefer to put the oil soluble surfactants in the oil phase and the water soluble materials in the water phase. In either case, the water phase is usually added quite slowly at first. This promotes formation of a W/O emulsion. As the water concentration is increased, the emulsion slowly becomes heavier, and finally reaches the inversion point, where the emulsion suddenly changes to an O/W type, accompanied by rapid thinning of the emulsion. After this point, the rate of addition of water can be increased. Use of the inversion technique usually fosters better stability by promoting finer particle size.

High oil content (90% or more) oil-in-water emulsions, which usually contain a very small amount (0.5%) of a hydrophilic surfactant as the emulsifier, are usually prepared by pre-mixing the water and an equal amount of oil to form a coarse emulsion. This coarse emulsion is then circulated through a homogenizer or mill while the remainder of the oil is being added.

In preparing clear emulsions, or solubilized oils, a hydrophilic surfactant is mixed throughly with the oils and then the water is added.

In preparing W/O emulsions, it is advisable to add the water phase very slowly to the oil-surfactant blend. Usually after addition of the water phase is complete, the emulsion is homogenized or milled, although this may be unnecessary if a well balanced emulsifier blend is used.



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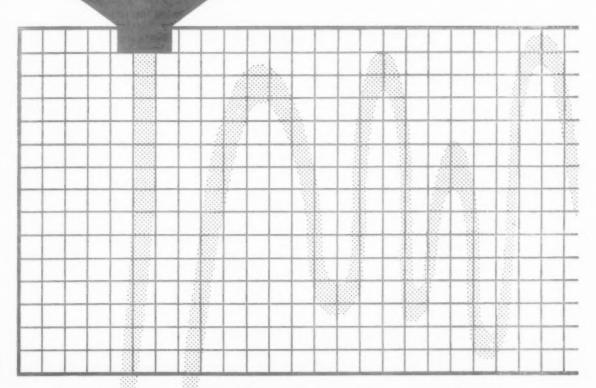
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# even consistency over a wide temperature range

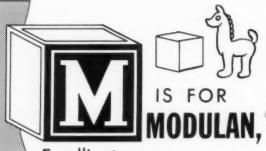


# Acetoglycerides

ABRAC

A. BOAKE, ROBERTS & CO LTD LONDON E15 · ENGLAND With cosmetic creams, variations in temperature need be a problem no longer. ABRAC ACETOGLYCERIDES have the answer. Whether it blows hot or cold, with an acetoglyceride in the formulation, an even consistency is maintained. What is more, exceptional emollient properties are obtained without excessive greasiness; and ease of 'absorption' by the skin is improved. In lipsticks, acetoglycerides enhance plasticity and reduce bleeding under wide variations of temperature.

Send for Technical Information Bulletin 227. It describes the various grades of ABRAC Acetoglycerides in full detail, and gives suggested formulae for their inclusion in creams and lipsticks.



Emollient supreme, For skin and hair Works like a dream.

Yes, MODULAN is above all an emollient. It is lanolin, modified by acetylating the hydroxyl groups to gain extremely valuable new conditioning properties and effects when used on skin and hair.

(U. S. Patent No. 2,725,334 and foreign patents.)

MODULAN is hypo-allergenic and nonirritating.

Some of the outstanding characteristics of MODULAN ARE -

Oil soluble, hydrophobic Substantive yet permeable films Practically odorless

Soft-waxy, non-tacky protective films Compatible with o w emulsions Compatible with soaps and foams

MODULAN is particularly recommended for use in creams, lotions, baby oils, hair preparations, shaving creams, cream shampoos, lipsticks and ointments.

We would be happy to supply you with technical literature, suggested formulas and samples. Please write on your business letterhead.



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In the preparation of emulsions it is usually best to have all of the emulsion ingredients, including the emulsifier, but excluding the added phase, in the mixing vessel at the time of emulsification. There are exceptions to this rule. For example, when astringent salts are added to an emulsion they should be added after emulsification is complete. Other exceptions exist, for example, in the preparation of pigmented creams, the pigments are sometimes added after emulsification has been achieved. Usually best stability is achieved if these are added when the emulsion is almost cool.

If perfume is added to a formula, it should be added at 45-50°C. or cooler to prevent volatilization of the perfume oil.

#### **Agitation Rate**

The agitation rate should be adjusted so that the two phases are mixed effectively, but so that air is not incorporated as a third phase. Air entrapment reduces emulsion stability because the emulsifier tends to migrate to the air-emulsion interface instead of remaining at the oil-water interface.

#### Cooling Rate and Pouring Temperature

For most emulsions slow cooling usually results in the best emulsion product. During cooling slow but thorough agitation should be used. Occasionally, howeyer, fast cooling of an emulsion promotes fine particle size which in turn means better stability. This is particularly true of high wax content liquid emulsions. The cooling rate is determined largely by the type of equipment available and, of course, is speeded wherever possible in production.

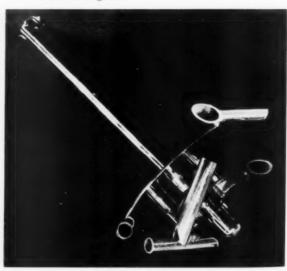
If emulsions such as cold creams are to be hot poured they should be poured just above the set point of the emulsion

#### Altering Emulsion Viscosity

The viscosity of emulsion products can usually be altered by making slight changes in ingredient types or concentrations. The following are general rules for increasing and decreasing viscosity.

To increase viscosity:

- (1) Increase the proportion of internal phase.
- (2) Increase the melting point of the internal phase.
- (3) Add thickeners such as soap gels, glycerol monostearate or gums.



"Plenty Impelator"—Semi-Industrial Type

To decrease viscosity:

(1) Increase the proportion of external phase.

(2) Decrease the viscosity of the external phase.

(3) Decrease the melting point of the internal phase.

(4) Add hydrophilic surfactants.

#### Preservation

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Cosmetic products are subject to contamination by microorganisms during preparation and use. Growth of these microorganisms does not usually occur. Some products such as W/O emulsions or emulsions containing astringent salts are less subject to such growth. However, it can and does take place. Accordingly products should be protected with a preservative. Some preservatives which have been used in cosmetic products are: methyl parahydroxybenzoate, propyl parahydroxybenzoate, dehydroacetic acid, sorbid acid, and quaternary ammonium compounds.

#### Use of Antioxidants

In cosmetic emulsions in which vegetable oils or other unsaturated products are included, it is usually considered good practice to include an antioxidant in the formula.

Generally speaking, 0.05 to 0.1 per cent antioxidant, based on the fat content, is sufficient to protect the average emulsion. Materials, such as butylated hydroxy anisole, butylated hydroxy toluene, nordihy droguioretic acid, the gallates, hydroquinone, propenyl methyl guaethol and alkyl thiodipropionates are all effective. Certain water soluble materials like the alkanolamines, alcohols and polyols have antioxidant properties.

#### **EVALUATION**

#### **Emulsion Type**

Emulsification progress can be followed and the finished product can be evaluated by determining emulsion type. One means of accomplishing this is by determining electrical conductivity. O/W emulsions conduct electricity; W/O emulsions do not. A second way to determine emulsion type is by dye solubility. A water soluble dye will disperse in an O/W emulsion while it will remain in its original form in a W/O emulsion. Still another way to determine emulsion type is by testing the water dispersibility of the emulsion. O/W emulsions will be dispersible; W/O emulsions will not disperse or will appear as globules throughout the water.

#### Consistency or Viscosity

Evaluation of the consistency of creams, and even the viscosity of lotions and solutions, is one of the problems that plagues cosmetic chemists. Many instruments such as cone penetrometers, falling ball viscometers, and rotational viscometers are used. In addition to these, many special instruments and tests have been designed to evaluate consistency. For example one test measures consistency in terms of the weight necessary to push a plunger through a cream at a given rate.

This area is one in which there is much room for investigation. Along these lines, a committee appointed by the Society of Cosmetic Chemists is studying the possibility of preparing standards for evaluating typical cosmetics, and these standards will undoubtedly include ways of evaluating consistency and viscosity.

#### Stability

Stability of a cosmetic product is evidenced by lack of changes in that product over a period of time. Ideally, the emulsion should retain the same appearance, odor, consistency or viscosity, and particle size. The emulsion type should remain the same.

One way of testing emulsion stability is by subjecting the product to temperature changes. Usually heat stability (up to about 50°C.) and freezing-thawing tests are run. Occasionally these tests are combined to determine tendency of the emulsion to separate when subjected to alternate heating-freezing cycles.

Another means of evaluating stability is by centrifuging the emulsified product. Any tendency toward separation is usually detected by this test.

Still another means of estimating emulsion stability is by observing the stability of diluted emulsions (8,7).

In addition to these methods, microscopic examination is often a useful method in studying emulsion behavior. Periodic particle size frequency analyses usually give a good indication of the rate of coalescence, and hence the tendency toward instability. Such analyses are time consuming and not usually considered practical for screening emulsifying agents but are extremely useful in evaluating finished products.

All of these methods have merit in some cases, but none of them can replace actual shelf life testing. In evaluating finished products, correlation of results of accelerated testing with results of actual shelf life testing will reveal which accelerated tests are most meaningful.

#### SOME TYPICAL FORMULAS

Surfactants find many uses in cosmetics. They may be used as thickeners, solubilizers, detergents, O/W emulsifiers, W/O emulsifiers, milkifiers, conditioning agents or emollients. The following formulas illustrate some typical functions of surfactants.

#### Surfactants as O/W Emulsifiers Anti-perspirant cream(8)

14.0%
2.0%
1.0%
5%
5.0%
51.0%
q.s.
plex 22.0%
q.s.

Preparation: Heat A to 70°C. Add B at 85°C. to A. Cool, with agitation, to 35°C. Add all of C. Agitate until C is dissolved. Add perfume and pack.

#### Astringent lotion(9)

A	Polyoxyethylene cetyl alcohol <sup>(e)</sup> Mineral oil	$\frac{4\%}{10\%}$
В	Aluminum sulfate Preservative Water to make	5% q.s. 100%

C Perfume and color q.s. Preparation: Heat A to 65°C. Heat B to 65°C. Add B to A under agitation. Perfume at 45°C., and stir until cold.

#### Cold wave lotion(9)

Polyoxyethylene cetyl alcohol(c)	5%
Light mineral oil	2%
35% Ammonium thioglycolate	20%
Ammonia water	q.s.
Water to make	100%

Preparation: Use the same procedure as for Astringent Lotion, but add the thioglycolate when the basic emulsion has cooled.



## From the castor bean. A lanolin ester Fit for a queen.

The RICILANS are 100% active, unsaturated polymeric derivatives of lanolin and castor oil. They are classed as true liquid waxes. The RICILANS are exceedingly stable, almost odorless viscous hydroxyesters which have balanced hydrophilic and hydrophobic groups. An acetylated form is available (Ricilan C) with increased hydrophobic characteristics. These unique products were developed by our Research Laboratories to provide cosmetic chemists with completely new tools for cosmetic research and formulation.

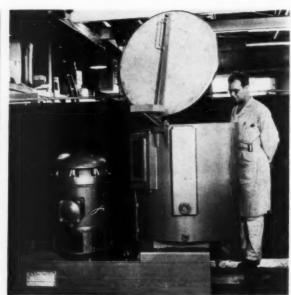
The RICILANS are unusual emollients, penetrants and spreading agents. They dissolve, plasticize and solubilize most cosmetic raw materials. We recommend that they be used in lipsticks for emollience, gloss, and color enhancement; in aerosols for the emollient films they impart; and in creams, lotions, and hair preparations for the unusual soft, waxy after-feel left on skin and hair.

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#### Surfactant Used as a Solubilizer Bath Essence(9)

	Polyoxyethylene cetyl alcohol (4)	20-30%	(to obtain
A -	Perfume Compound	10%	clarity)

B Water and color to make 100% Preparation: Mix A and when clear, add B while stir-

#### Solubilized perfume oil(8)

	Perfume oil		1%	
	A Polyoxyethylene monooleate (e)	sorbitan	n%	(to obtain clarity
P	Water	0	0-n CL	

Preparation: Mix A well. Add B to A slowly with agitation. Allow cloudiness to clear before further addition.

#### Surfactant as a Detergent Cream Shampoo(10)

Sodium lauryl sulfate paste	e <sup>(r)</sup> 50.0%
Sodium stearate, made in s	
Hydrous lanolin	1.0%
*** *	00 00/ 4- 44 00/

39.0% to 41.0% Preparation: Dissolve sodium hydroxide in water at 71°C. Add sodium lauryl sulfate paste and mix until homogeneous. Add melted stearic acid. Mix well. Add lanolin. Mix for one hour at 71°C. Settle for one hour without agitation. Skim off foam. Start gentle agitation until the batch cools to 50°C. Add perfume. Mix gently.

#### Surfactant as a W/O Emulsifier Hair Drossing Lation(8)

	nair Dressing Lotton	
	Petrolatum	7.5%
A	Mineral	37.5%
	Lanolin	3.0%
	Sorbitan sesquiolate <sup>(g)</sup>	3.0%
	Beeswax	2.0%
	Zinc stearate	1.0%
	Borax	0.5%
В	₹ Water	45.5%
	Preservative	q.s.
C	Perfume	q.s.

Preparation: Heat A to 75°C. Heat B to 77°C. Add B



 Myvacet Distilled Acetylated Monoglycerides, Type 9-40

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Myvacet Distilled Acetylated Monoglycerides, Type 5-00



3. Myverol Distilled Monoglycerides, Type 18-06 (Free-flowing beads)

# Fuel for cosmetic creativity



4. Myverol Distilled Monoglycerides, Type 18-71

#### **Newer Emulsifiers**

Monoglycerides are not new. "Glyceryl monostearate" has been used by cosmetic formulators for years in making water-in-oil emulsions.

But a monoglyceride that's over 90% monoester is something so different that it can give a new direction to your products. We make it by molecular distillation to produce a uniform, stable, bland emulsifier that's non-ionic, neutral, and contains no residual soaps or catalysts—meets N.F. standards, of course. We call it Myverol® Distilled Monoglycerides. Try it in creams, lotions, lipsticks, ointments and other products based on water-in-oil emulsions. Its very purity is what gives it a unique behavior.

We make Myverol Distilled Monoglycerides in a number of types that are being used in cosmetics. Often, combinations of types can give you close control of viscosity and consistency.

#### **Newer Emulsifiables**

Myvacet\* Distilled Acetylated Monoglycerides—there is an entirely new type of ingredient for cosmetics. It's strangely non-greasy, not an emulsifier, but easily emulsified. Type 9-40 is completely miscible with castor oil and with alcohol-water mixtures containing as much as 20%water. It does what isopropyl myristate and isopropyl palmitate do in many preparations but without contributing greasiness. Type 5-00 is a highly flexible, easily emulsified solid.

The way to find out what these materials can do for your products is to try them. The way to try them is to write us for samples. *Distillation Products Industries,* Rochester 3, N. Y. Sales offices: New York, Chicago, and Memphis • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils



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ACETULAN is a 100% active, water thin lanolin derivative (viscosity 10 cps). It has phenomenal spreading and penetrating properties and imparts a unique soft waxy, emollient feel to skin and hair.

ACETULAN is composed of acetylated lanolin alcohols prepared by an exclusive process. It is soluble in alcohol, propellants, and in most oils. It acts as a solubilizer and plasticizer for many substances which are used in aerosols, emulsions, lotions, and make-up.

ACETULAN is hypo-allergenic and nonirritating.

#### SUGGESTED USES OF ACETULAN

Aerosols	Ointments and lotions
Emulsions	Rouge and lipsticks
Shampoos	Liquid make-up
Powders, talcs	Baby products
Nail polish removers	Hair preparations
Sun tan oils	Shaving preparations

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to A slowly with moderate, but thorough agitation. Perfume at 45°C. Continue agitation until cool.

#### Surfactant as a Conditioning Agent Cream Hair Rinse(11)

Quaternary ammonium base <sup>(h)</sup>	7%
Polyethylene glycol distearate	1%
Perfume	q.s.
Color	q.s.
Sodium chloride	0.2% to 0.5%
Water	to 100%

Preparation: Heat the quaternary ammonium base and polyethylene glycol distearate together and mix until the mixture is a thick translucent or clear gel. Add this mixture to the water which has been heated to 71°C. After mixing fifteen to thirty minutes cool the batch slowly with moderate agitation. Add sodium chloride and color at 60°C. to 66°C. Add the perfume at 50°C. and continue agitation until cool. Fill into bottles.

#### Surfactant as an Emollient Hand Soap(8)

20% aqueous solution of cononut oil soap	98%
Polyoxyethylene sorbitol lanolin or	
polyoxyethylene lanolin <sup>(k)</sup>	2%
Preservative	q.s.

Preparation: Heat lanolin derivative to 65°C. Heat soap solution to 67°C. Add soap solution to the lanolin derivative with agitation.

#### Identification of Surfactants Used in Formulas

- a Myr 52-Atlas Powder Co.
- b G-2162—Atlas Powder Co.
- Texofor A 6-Glovers (Chemicals) Ltd.
- d Texofor D 60-Glovers (Chemicals) Ltd.
- e Tween 80-Atlas Powder Co.
- f Duponol WA paste-E. I. duPont de Nemours and Co.
- g Arlacel 83-Atlas Powder Co.
- h Pendit CA-Rayette, Inc. Chemical Division
- Polyethylene glycol 400 distearate Kessler Chemical Co.
- G-1441-Atlas Powder Co.
- k G-1790—Atlas Powder Co.

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  3 Griffin, W. C. Clues to Surfactant Selection Offered by the HLB System. Official Digest (Federation of Paint and Varnish Production Clubs) Jane 1956).

  4 Griffin, W. C. Calculation of HLB Values of Non-ionic Surfactnots. Journal of the Society of Cosmetic Chemists, 5, (4), pp. 249-256 (December 1954).

  5 Davies, J. T. A Quantitative Kinetic Theory of Emulsion Type, I. Physical Chemistry of the Emulsifying Agent. Preprinted from the Proceedings of the Second Inernational Congress of Surface Activity. London, Butterworths Scientific Publications, 1957.

  6 Griffin, W. C. and Behrens, R. W. The Evaluation of Agricultural Emulsions. Agricultural Chemicals, 7, (3), pp. 63, 65 (March 1952).

  7 Griffin, W. C. and Behrens, R. W. Apparatus for Observing Emulsions. Analytical Chemistry, 24, (6), pp. 1076-1078 (June 1952).

  8 Atlas Powder Company. Typical Cosmetic Formulations Illustrating the Use of Allas Sorbitol and Surfactants. Wilmington, Delaware, Allas Powder Cempany, 1957.

  9 Glovers (Chemicals) Ltd., Wortley Low Mills, Wortley, Leeds 12, England.

  10 E. I. duPont de Nemours and Co. Inc., Organic Chemicals Department. Product Bulletin S-1 on Duponol<sup>(E)</sup> WAQ and Duponol<sup>(E)</sup> WA Paste Shampoo Formulations, Wilmington, Delaware, E. I. duPont de Nemours and Co. Inc.

  10 Revenue.

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# Triethanolamine Emulsions



#### Dr. Paul G. I. Lauffer

Dr. Lauffer is research director for the Northam Warren Corp. and prior to that was chief chemist and technical director of the George W. Luft Co. for 23 years. Before that he was chief chemist for Pinaud Inc. for six years. He was graduated from Washington and Jefferson College with the degree of B.S. and M.S. and subsequently took his M.A. and Ph.D. degrees from Columbia University. He is a past president of the Society of Cosmetic Chemists and for three years was a director. He is also a member of the American Chemical Society and of the Sigma Xi and Phi Lambda Upsilon fraternities. He has contributed numerous authoritative technical articles to scientific journals.

The modern age of cosmetics may with some justification be said to have begun with the use of the ethanolamines. Modern cosmetic practice involves the proper selection of ingredients from among thousands of available materials, whereas thirty years ago common cosmetic materials may have totalled a few score. Sodium and potassium soaps had been the only surfactants for many centuries, with the more recently added ammonium soaps and sulfonated oils finding only limited use. When the ethanolamines became commercially available in 1928, their obvious qualifications as cosmetic emulsifiers may have set a precedent for the later acceptance of many other new chemical products by our industry.

The synthesis originally devised by Wurtz¹ in 1862, combining ethylene oxide with ammonia, was that finally used in 1928 to produce the ethanolamines commercially. Trusler², in 1928 and 1929, wrote a series of papers for the chemical trade journals describing the versatile quality of the soaps of triethanolamine, and in the early 1930's the american perfumer carried articles by Lauffer³ and by de Navarre⁴ describing ethanolamine soaps and their use in forming cosmetic emulsions. Although surfactants have multiplied, in the past 25 years, like the proverbial rabbits, ethanolamine soaps are still highly regarded as components of creams and lotions.

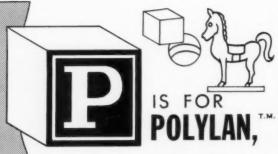
The ethanolamine first offered contained 75-80% triethanolamine (T.E.A.), 20-25% diethanolamine (D.E.A.), and 0-5% monoethanolamine (M.E.A.). Current Toilet Goods Association Standards recognize two grades of "T.E.A.": the 98% grade containing maxima of 0.2% M.E.A. and of 2% D.E.A., and the 85% grade containing maxima of 1% M.E.A. and of 15% D.E.A.

Possibly the outstanding advantage of T.E.A. soaps over those of sodium and potassium lies in the lower alkalinity of their solutions. Thus the pH of a 2.5% solution of T.E.A. stearate is about 8.9, that of a 2.5% solution of T.E.A.

tion of sodium stearate 9.9. A supplier lists<sup>5</sup> among the distinguishing qualities of emulsions prepared with T.E.A. soaps their small particle size, their ease of preparation, their non-corrosiveness, their wide flexibility in formulation, their stability in long storage, and their low sensitivity to temperature changes.

In some connections, the non-corrosiveness of the T.E.A. soaps, as compared with soaps of alkali metals, is of importance. T.E.A. is actually used as a corrosion inhibitor in pickling baths and in engine cooling systems. Pickett<sup>6</sup> reported the corrosiveness of lauryl sulfates in pressurized aerosol containers to be in the order: T.E.A.<Na<NH<sub>4</sub>. Yoshikawa & Nonaka<sup>7</sup> reported that T.E.A. added to ordinary cake soaps in 0.01 or 0.05% concentration was an effective antioxidant, although it was not similiarly effective in lard. T.E.A. was reported<sup>8</sup> to be toxic to bacteria in certain media, this effect being antagonized by ions of K, Na, NH<sub>4</sub>, Ca, or Mg, presumably by competition of these ions for combination with a negative site on an enzyme on or in the bacterial cell.

The low order of toxicity of T.E.A. is illustrated by the study of Smyth, Carpenter, and Weile, who found the subacute LD50 for T.E.A. given to rats orally in foods, to be 9.11 gm/kg body weight. The M.E.A. salt of vitamin C is used for intramuscular injection, and T.E.A. oleate is used in extemporaneous pharmaceutical compounding10, T.E.A. was listed11 among substances approved for addition to wax emulsions to prevent spoilage of fruit. A dental cleaner was patented12 containing 3% M.E.A. and 10% T.E.A. lactate in aqueous solution. Draize et al13 presented to the Scientific Section of the T.G.A. the results of a study of the subacute dermal toxicity of the three ethanolamines, and stated that, in the rabbit, these amines were found to have a very low order of toxicity, when used in concentrations of up to 5% in aqueous media or in U.S.P. hydrophilic or white



For skin way ahead, Essential fatty acids To lanolin wed.

Yes, the bells are ringing for this outstanding new development of our Research Laboratories. POLYLAN is the 100% active liquid wax ester of linoleic acid and fractionated lanolin alcohols. We have achieved essential unsaturation (lodine no. 120) without sacrificing stability, and offer a product with remarkable penetration and emollient effects.

Cosmetic and pharmaceutical chemists are aware of the importance of unsaturation in epidermal metabolism. We invite you to try POLYLAN wherever essential unsaturates are indicated to improve the effectiveness of a cream, lotion or pharmaceutical product.

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ointment base. The M.E.A. was slightly more irritating than the others under the experimental conditions.

For most emulsions, 2-4% T.E.A. and 5-15% oleic or stearic acid, based on the weight of the material to be emulsified, are sufficient<sup>14</sup>. Diserens, Hill, and Miller<sup>15</sup> reported on the variation of emulsion consistency of ethanolamine stearate emulsions of oil in water, as the amine composition was altered from 100% T.E.A. to as low as 67.5%. Increase of M.E.A. and D.E.A. content lowered the viscosity. These emulsions were all prepared, however, with constant percentages of the amine mixtures, so that higher mono- and di-amine content also meant a larger number of gram equivalent weights of total amine, therefore less free stearic acid in the formulation. It would be interesting to see how the viscosities of similar emulsions would run, if equivalent instead of equal weights of total amines were used.

Harry<sup>16</sup> states that T.E.A. soaps give vanishing creams with excellent sheen but rather soft. The addition of a little sodium hydroxide stiffens them.

The following table given by Wilson<sup>21</sup> shows the composition of stable emulsions of various oils, using ethanolamine and oleic acid as emulsifiers, excepting in the wax emulsions, where stearic acid was used instead of oleic. These emulsions can be diluted with water until their oil content is reduced to the percentage given in the last column, and still show no separation on standing 24 hours.

Kind				I	Dilutio	n
of Oil	Oil	Acid	Base	Water	%	
		(Part	s by W	eight)		
Mineral Oils-						
White rose*	88.0	9.0	3.0	100	5	
Diamond paraffin+.	89.0	8.0	3.0	100	5	
Petrolatum	76.0	20.0	4.0	300	20	
Vegetable and						
Animal Oils-						
Cottonseed	90.0	8.0	2.0	50	10	
Olive	77.0	20.0	3.0	50	10	
Caster	91.0	6.0	3.0	100	20	
Waxes-						
Paraffin m 122° F.	88.9	8.3	2.8	300	10	
Carnauba	87.3	8.7	4.0	400	10	
Stearic acid		95.0	5.0	400	10	
*Viscosity. 92 sec	onds:	sp. gr.,	0.876.			
†Viscosity. 92 sec	onds:	sp. gr.,	0.884.			

The soap used in the above emulsions, as calculated by multiplying the ethanolamine by 3.15 varies from 1.7% to 17.5% of the weight of oil. An excess of acid is used in nearly all these examples.

Three methods are used in making these emulsions. (1) Dissolve the soap in the oil, with gentle warming and stirring. The amount of soap required to emulsify vegetable oils is generally about 6 to 8% of the weight of oil, though some oils such as linseed require considerably less. Mineral oils usually require slightly more soap than vegetable oils, in some cases up to 10%, the exact amount depending on the grade of oil used. The addition of a small amount of fatty oil often helps to emulsify a mineral oil. If the amount of soap needed is too great to use economically, resin soap may be substituted for part of the ethanolamine soap.

This solution of soap in oil is a clear liquid, which may be kept as a stock solution. To make an emulsion from it, stir in water slowly until about 15% on the weight of oil has been added, the mixture thereby becoming thickened to a creamy paste. The ingredients should be mixed thoroughly at this stage, after which the rest of the water is added. By this method, the

thinner emulsion.



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the Croda Organization sells

over 10,000,000 pounds

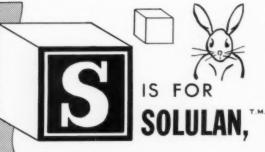
of lanolin and lanolin

derivatives per year...

that's a lot of lanolin!



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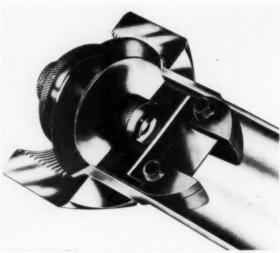


American Cholesterol Products

AMERCHOL PARK - EDISON, N. J.



The Rapisonic, Sonic Engineering Co.'s versatile production homogenizer



Ultrasonic head, showing vibrating blade and jet stream orifice. Sonic Engineering Co.

(2) An alternate method, using less soap, is to mix the soap thoroughly with twice its weight of water, giving a sticky, creamy mass, then slowly stir in the oil, forming a mayonnaise-like emulsion, unstable until the rest of the water may be added slowly, forming a soap required is only 4 to 8% of the weight of oil.

(3) The saponification and emulsification may be combined into one operation by dissolving the fatty acid in the oil mixture, and adding this to a solution of ethanolamine in water, with agitation. If a solid acid such as stearic is used, it is necessary to warm both solutions before mixing, so that the acid is melted. An excess of acid is generally used, as it produces emulsification, and increases stability.

#### Ethanolamine in Creams and Lotions(3)

Of the above methods, the last is most frequently used in cosmetic preparations. The acid used is nearly always stearic, since it gives a whiter product than oleic, so it is generally necessary to warm the solutions above the melting point of stearic acid, before mixing.

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stearic acid, ethanolamine and water. Paraffin may be added to the oil, and glycerol or carbitol to the water, the latter greatly increasing the stability of the emulsion, and making washing easier. Some formulas worked out at the Mellon Institute are:

VANISHING CREAM Stearic acid 22	CLEANSING CREAM Stearic acid 12
Ethanolamine 1	White paraffin oil 40
Carbitol 10	Ethanolamine 4
Water 67	Carbitol 4
COLD CREAM	Water 40
Stearic acid 14	AFTER-SHAVING
White paraffin wax . 22	CREAM
White paraffin oil 22	Stearic acid 15.0
Ethanolamine 2	Ethanolamine 0.75
Carbitol 7	Carbitol 8.0
Water 33	Menthol crystals . 0.75
	Absolute alcohol . 0.5
	Water 75.0

The numbers given are all parts by weight. The ethanolamine and carbitol are added to the water, and the waxes and oils and stearic acid are melted together, then poured into the water solution slowly, with stirring, both solutions being at about the same temperature when the addition is made.

Strianse17 gives the following formulas:

	Hand	Hand
	Lotion	Cream
Lanolin	1.	1.
Cetyl Alcohol	.5	
Stearic Acid	3.	16.
Propyl Paraben		.05
Glycerol	2.	
Propylene Glycol		10.
Methyl Paraben	.1	.15
КОН		.6
NaOH		.1
T.E.A.	.75	.3
Quinceseed Mucilage, 2%		25.
Water	92.65	46.8
Perfume and color	q.s.	q.s.

Barnett18 cites the following formulas for emollient lations:

weights:		
	1	2
Lanolin	1.04	3.
Mineral Oil, light	26.	7.
Cetyl Alcohol	.52	
Stearyl Alcohol	.94	
Stearic Acid	.94	3.
Oleic Acid		1.
Butyl Paraben	.01	
Propyl Paraben		.15
Methyl Paraben	.09	.15
T.E.A.	.52	1.5
Sodium Alginate	.36	
Water	69.33	83.9
Perfume	.25	.3

The procedure consists simply of heating the oil and the water phases separately to 70°, stirring the oil into the water phase, stirring to 40°, adding perfume and color. The solid creams are filled at about 40°. The lotions at about 30°.

In the above formulas, T.E.A. soap was used alone as

for Macrocyclic Musk

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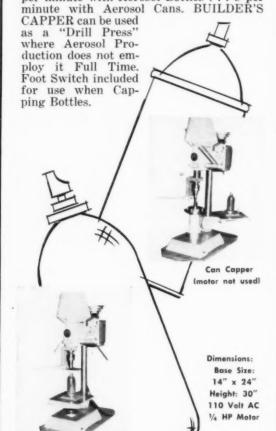
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**Bottle Capper** (motor used)

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emulsifier, or in combination with alkali soaps or with gums. T.E.A. soaps have also been used successfully in conjunction with a wide variety of nonionic emulsifiers, such as:

Glyceryl monostearate Diethylene glycol monostearate Polyethylene glycol monostearate

Lanolin derivatives

Sorbitan ester-P.O.E. sorbitan ester combinations Kremnev and Kuibina<sup>19</sup> reported that T.E.A. oleate can stabilize both O/W and W/O emulsions. Emulsions of benzene in water were found to have about the same film thickness (100-110 A.), corresponding to 50-70  $A^2$ /mol., whether made with T.E.A. oleate or stearate; they therefore concluded that the double bond in the oleate had no significant effect upon the emulsifying action.

T.E.A. soaps, and creams made therefrom, have a tendency to turn yellow with aging under some conditions. Avoidance of metallic impurities, especially iron, helps prevent such darkening. T.G.A. standards call for a maximum of 15 p.p.m. of iron, and care should be taken to prevent its access from equipment or from other ingredients. Wolff20 claimed that inclusion of 1-2% H.SO3 in T.E.A. keeps a cream made therefrom white, if the cream is not heated above 70° during manufacture.

Isopropanolamines are somewhat less susceptible to darkening than ethanolamines, and they are commercially available. A large number of alkyl and dialkyl ethanolamines have been prepared by treating primary and secondary amines, respectively, with ethylene oxide, but so far none of these has found use as a cosmetic

ingredient.

Triethanolamine has also been substituted for sodium as the cationic component of many surfactants besides the fatty acid soaps. Schon21 reviewed the uses of T.E.A. and M.E.A. dodecyl sulfates, principally as shampoo ingredients. A non-tacky detergent composition was patented22 containing T.E.A. salts of alkyl aryl sulfoacids mixed with lecithin. A patent was issued23 for drilling mud additives containing the T.E.A. salt of carboxymethylcellulose, which, added in the ratio of one pound to a barrel of mud, cut the water loss by two thirds.

The attitude of T.E.A. toward the flood of new surfactants appears to be: "If you can't beat 'em, join 'em." It looks as though T.E.A. will be around for another thirty years.

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# **AEROSOL EMULSIONS**



#### Morris J. Root

Mr. Root is technical director of G. Barr & Co. a position he has held since 1953. Prior to that he was assistant research director of Raymond Laboratories and before that was with the Mines Experiment Station of the University of Minnesota. He took a Bachelor of Chemical Engineering degree from the University of Minnesota in 1939 and his Master of Science in Chemical Engineering degree from the Institute of Technology of the University of Minnesota in 1941. He is a member of the American Chemical Society, and is national membership chairman of the Society of Cosmetic Chemists and on the technical committee of the Chemical Specialties Manufacturers Assn.



Dodge and Olcott Aerosol Laboratory

#### MORRIS J. ROOT\*

Emulsion technology has taken on increased significance in aerosol formulation with the introduction recently of emulsion spray products. Early aerosol foam products, such as shaving creams, hand lotions and shampoos, are oil-in-water emulsions with the liquified propellent in the oil phase. Recently an aerosol foam wax automobile polish has been introduced which is also an oil-in-water type emulsion. Aerosol emulsions can first of all be classified as to whether the product is delivered as a foam or as a spray; secondly, they can be classified as to water-in-oil or oil-in-water. In general, all emulsification principles that hold true for conventional emulsions can be applied to aerosol emulsions. Emulsifiers must be chosen with respect to their emulsification properties with the liquified propellent, the chlorofluoromethanes and ethanes.

#### Foam Aerosol Emulsions

A. Oil-in-water Emulsion Foam

Shaving creams and hand lotions, which come under this classification, have had the greatest distribution of all the aerosol foam products. Although whipped cream would also come under this classification, it wlll not be considered here, because the propellent is a non-condensible gas, nitrous oxide and carbon dioxide, rather than a liquified propellent. An example of a shaving cream formulation is the following:

Part A	Water (deionized)	q.s.	500	ga	llons	
	Sorbo®		160#			
	Triethanolamine		169#			
	KOH Pellets		7#	8	OZ.	
Part B	Polyvinylpyrrolidone		10#			
Part C	Stearic Acid		262#			
	Coconut Fatty Acid		75#			
	Cetyl Alcohol		61#			
	Petrolatum		94#			
	Perfume		5#	8	OZ.	

(Sorbo®-Atlas Powder Co., Wilmington, Del.)

Heat water to 160° F. Add the triethanolamine, potassium hydroxide and Sorbo® and maintain temperature. Mix well. Dissolve the PVP in 25 gallons of water and add to Part A. Heat Part C to 165° F. and mix. Then add the oils to the water mixture and stir for twenty minutes. Begin to cool the emulsion and agitate at the same time. Add perfume at 105°-110° F. Cool the shaving cream to room temperature.

The above product is charged with 10% propellentdichlorodifluoromethane or a mixture of dichlorodifluoromethane and tetrafluorodichloroethane.

The following are other examples of foam type aerosol emulsions of the oil-in-water type.

#### Aerosol Rug & Upholstery Cleaner

		Parts by Weight
Part A	Coconut fatty acids	14.2
	Isopropyl alcohol	4.8
	Triethanolamine	9.5
	Perfume	q.s.
Part B	Veegum®	4.8
	Water (deionized)	61.7
Part C	Dichlorodifluoromethane	5.0
Part C	Dichlorodifluoromethane	5.0
(Veegur	m®-R. T. Vanderbilt Co.,	Inc., New York
17. N.Y.)		

Melt the fatty acids, add alcohol, triethanolamine and perfume, mix. Add Veegum® slowly to water, mixing until smooth. Add Part A slowly to Part B with slow agitation until smooth. Pressure fill the propellent.

#### Aerosol Protective Hand Cream

		Parts by Weight
Part A	Myristic Acid	10.0
	Stearic Acid, N.F.	40.0
	Cetyl Alcohol, N.F.	3.3
	Modified Lanolin	3.3
	Isopropyl Myristate	11.7
	Triethanolamine	11.7
	Silicone Oil DC 555®	20.0
Part B	Glycerol	15.0
	Polyvinylpyrrolidone (	PVP) 1.7
	Water (deionized)	878.3
Part C	Perfume Oil	5.0

\*40 parts dichlorodifluoromethane and 60 parts dichlorotetrafluoroethane

(Silicone Oil DC 5558—Dow Corning Corp., Midland, Mich.)

Polyvinylpyrrolidone—Antara Chemical Division, General Aniline & Film Corp., New York 14, N.Y. Heat Parts A and B separately to 160° F. to melt and dissolve. Add Part B to Part A while stirring. Add Part C when cool. Pressure fill Part D.

As can be seen from the above formulations, the emulsifier most frequently used is the triethanolamine fatty acid soap. This is a particularly good oil-in-water emulsifier for the fluorinated hydrocarbons. The fatty acid alkanolamides are also good emulsifiers for this purpose.

Both the fluorinated hydrocarbons and the hydrocarbons are used in aerosol foam products. Dichlorodifluoromethane alone or a mixture of dichlorodifluoromethane and tetrafluorodichloroethane are the most commonly used fluorinated hydrocarbons. Trichlorofluoromethane is not suitable in water systems because of its susceptibility to hydrolysis, especially in an alkaline solution.

Hydrocarbons which are used in aerosol foam products include propane, butane and isobutane. Mixtures of these propellents can be made to have the same vapor pressure as mixtures of the chlorofluoromethanes and ethanes. Although the hydrocarbons are flammable, in formulations of this type that contain large amounts of water and relatively small amounts of propellent, this is not an important consideration. The amine fatty acid soaps are good emulsifiers for the hydrocarbons as well as the fluorinated hydrocarbons. Equally suitable are the Spans® and Tweens®, fatty acid amine sulfates and fatty acid alkanolamides.

There are four factors of importance in a foam type aerosol product.

- total pressure
   quality of foam
- percentage overrun
   percent discharge

The vapor pressure developed by a foam product depends primarily on the propellent or mixture of propellents used, on the solvents present and, to a minor degree, on the quantity of propellent used.

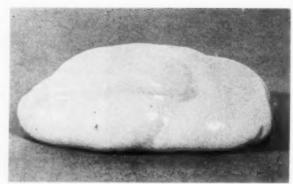
Formulation, type of propellent, and propellent concentration will affect the foam quality. Stiff, dry, resilient foams are obtained with high solids formulations, a high vapor pressure propellent, and a high concentration of propellent. Conversely, soft, wet, flat foams are obtained with low solids formulations, a lower vapor pressure propellent, and a lower concentration of propellent.<sup>2</sup>

The percentage overrun is given by the following equation:

$$\% \text{ Overrun} = \frac{\text{Volume of Foam-Volume of Liquid}}{\text{Volume of Liquid}} \times 100$$

Formulation and concentration of propellent are the governing factors on percentage overrun. On a properly formulated shaving cream, volumes of about 1000% overrun are obtained.

Sometimes the foam will grow, so that after a few seconds, the overrun will be greater than immediately after dispensing. See Photographs 1 and 2 of a foam taken immediately after dispensing and ten seconds later. The growth is due to the presence of a lower vapor pressure propellent or the presence of a co-solvent which reduces the effective vapor pressure of the propellent. The slow vaporization of the propellent in the oil droplets of the inner phase of the emulsion causes the foam



1. Foam immediately after dispensing



2. Foam ten seconds after dispensing

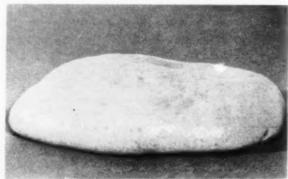
to increase in volume.

One very important characteristic of a foam product dispersed from a pressurized system is the percent discharge. This varies directly with the percentage propellent and its vapor pressure. With a properly formulated product, values of 90% to 95% can be expected.

Foam stability was not mentioned as one of the important factors since it is not always critical. In shaving creams, however, stability is important since the foam must remain stable for some time. In products such as hand lotions, hand cleaners and wax polishes, foam stability is not necessary since the product is used almost immediately after dispensing.

B. Water-in-oil Emulsion Foam

Foam products made by using a water-in-oil emulsion give unstable and flat, wet foams since the propellent is in the outer phase and, therefore, not finely dispersed. An example of this type of foam is shown in Photograph 3. Release of propellent from the outer phase does not result in as fine or voluminous a foam as when the propellent is in the dispersed phase. Only when the propellent is vaporized from many small droplets



3. Flat foam of water-in-oil emulsion

C



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this type include charcoal lighter foam, wax furniture formulations of the oil-in-water emulsion aerosol spray. polish, and emollient skin cream.

Emollient Skin Cream

	Parts by Weig
Lanolin U.S.P. Anhydrous	19.1
G-1425®	0.9
Castor Oil AAA Grade	70.5
Water	9.5

(G-1425®-Atlas Powder Co., Wilmington, Del.) The water and G-1425® is mixed and heated to 150° F., then slowly added with agitation to the castor oil and lanolin which has been heated to 160° F. After emulsification is complete, the product is filled into cans. After the valve has been crimped in place, ten percent by weight of dichlorodifluoromethane is pressure filled into the container. Although the foam stability of this prod-

uct is poor, this does not interfere with its functionality.

Where it is necessary or desirable to have a waterin-oil foam type aerosol emulsion with good foam stabiliity, it can be accomplished in a circuitous manner. If the propellent is first emulsified in water using a suitable emulsifier and then pressure filled into the waterin-oil emulsion, there results a system which can be designated as an oil-in-water/water-in-oil emulsion. The dispersed phase is droplets of water and droplets of propellent emulsified in water (oil-in-water phase). The continuous phase is the oil which now does not contain the propellent. This type of emulsion gives a rich, stable foam although there is only a small amount of water present.

#### **Spray Aerosol Emulsions**

A. Oil-in-water Emulsion Spray

The development of "mechanical break-up" actuators for aerosol valves has made it possible to spray products which contain only a small amount of propellent. The propellent in aerosol products is used for two purposes, one, to provide a source of pressure and, two, to provide a low-boiling ingredient in the formulation which flashes when released to the atmosphere. In the oil-inwater type emulsions the purpose of the propellent is only to serve as a source of pressure. These systems are particularly convenient for those products that have active ingredients which are soluble in water. The advent of the water-based aerosols makes it practical to make many products heretofore impossible.

Emulsification of the liquified propellents into an aqueous system has been accomplished by non-ionic, cationic and anionic surfactants. The non-ionics have been found to be the most desirable. The ratio of sufactant to propellent can vary all the way from 5/1 to 1/4, depending on the formulation. An increase in the concentration of the surfactant sometimes causes the emulsion to become transparent. Although such emulsions are practically clear, there is little question about their being emulsions since they exhibit the Tyndall Effect. The following table shows the solubility of Genetron® 12 in twenty grams of various surfactants.3

This type of formulation is applicable to such products as antiperspirants, plant sprays, and glass cleaners

does a rich, fine foam result. Examples of products of as well as a host of others. The following are typical

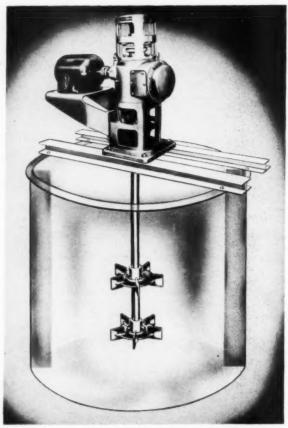
Antiperspirant

	Percent by Weight	
Aluminum Chlorhydrate	15.0	
Water	17.0	
SDA #40 Anhydrous Alcohol	60.0	
Tween® 80	2.0	
Arlacel® 80	1.3	
Dichlorodifluoromethane	4.7	
	100.0	

(Tween® 80—Atlas Powder Co., Wilmington, Del.) Arlacel® 80—Atlas Powder Co., Wilmington, Del.) The propellent is pressure filled.

Plant Spray

	Percent by Weight
Pyrethrins	0.5
Piperonyl Butoxide	5.0
Petroleum Distillate	4.5
Water	78.0



Mixing Equipment Company's Model TEQ Heavy Duty Top Entering Lightnin Mixer."

urfactant Trade Name	Classification	Genetron® 12 Solubility in 20 grams
Emcol 4150	Complex fatty acid derivative of aliphatic sulfonate	2.3 grams
Hyonic FA 40	Fatty alkylolamine	10.5 grains
Igepal CO 630	Nonyl phenoxy polyoxyethylene ethanol	11.1 grams
Triton X-100	alkyl aryl poly-ether alcohol	10.1 grams
Tween 80	Polyoxyethylene sorbitan monooleate	5.1 grams

Su

Tween® 80	6.0
Arlacel® 80	4.0
Dichlorodifluoromethane	2.0
	100.0

The propellent is pressure filled.

#### Class Clasner

Glass Cleaner	
	Percent by Weigh
Isopropanol (99%)	25.0
Carbitol® Solvent	7.5
Tergitol® Anionic 7	0.3
Water	64.0
Tween® 80	0.9
Arlacel® 80	0.6
Dichlorodifluoromethane	1.7
	100.0

(Carbitol Solvent-Union Carbide Chemicals Co., New York 17, N.Y.

Tergitol<sup>R</sup> Anionic 7-Union Carbide Chemicals Co., New York 17, N.Y.)

The propellent is pressure filled.

a so-called "mechanical break-up" actuator manufactured by several valve suppliers. A valve without this refinement will cause the product to stream instead of spray

B. Water-in-oil Emulsion Spray

This system offers an alternate method of spraying water soluble products. With this system a small amount of water can be used to dissolve the active material. By emulsifying this into the propellent system, a spray product can be formulated. The propellent forms the "outer" or "oil" phase, and the water and active material the "inner" or "water"phase. Because these systems use a relatively large amount of propellent, it is not feasible to use the liquified hydrocarbons as propellent due to their flammability.

Emulsifiers which have been found most useful with the chlorofluorohydrocarbons include:

- (1) Emcol® 14-a polyglyceride ester of a fatty acid -Emulsol Chemical Div., Chicago 1, Ill.
- (2) Span® 20-sorbitan monolaurate-Atlas Powder Co., Wilmington 99, Del.
- (3) Polyethylene Glycol 400 di-triricinoleate-Glyco Products Co., Inc., New York 1, N.Y.

Products such as sun tan sprays, skin fresheners, and With all of these formulations it is necessary to use antiperspirants can be formulated with this system. A

#### TABLE I. EMULSION SYSTEMS PRODUCING FINE SPRAYS

Emulsifying Agent: 2 parts by weight of "Emcol-14"

No.	"Freon" Propellent	Auxiliary Solvent	Composition in Parts by Weight, Prop./Solvent/Water	Spray	Separation Time	Pressure at 70°F., Psig	Flam- mability*
1	"Freon-12"	Kerosene	60/20/20	Fine	4-5 Min.	57	NF
2	"Freon-12"	Kerosene	60/30/10	Fine	>24 Hrs.	52	FL
3	"F-12"/"F-11" (30/70)	None	90/0 /10	Fine	>20 Min.	24	NF
4	"F-12"/"F-11" (30/70)	None	80/0 /20	Fine	>20 Min.	24	NF

#### TABLE II. EMULSION SYSTEMS PRODUCING MEDIUM SPRAYS

Emulsifying Agent: 2 parts by weight of "Emcol-14"

No.	"Freon" Propellent	Auxiliary Solvent	Composition in Parts by Weight, Prop./Solvent/Water	Spray	Separation Time	Pressure at 70°F., Psig	Flam- mability*
5	"Freon-12"	Kerosene	40/20/40	Medium to Fine	>24 Hrs.	52	NF
6	"Freon-12"	Kerosene	40/30/30	Medium to Fine	>24 Hrs.	46	FL
7	"Freon-12"	Kerosene	40/40/20	Medium to Fine	>24 Hrs.	41	FS
8	"F-12"/"F-114" (15/85)	Mineral Oil	60/20/20	Medium to Fine	3-4 Min.	24.5	FL
9	"F-12"/"F-114" (15/85)	Mineral Oil	60/30/10	Medium	8-10 Min.	23.5	FL
10	"F-12"/"F-11" (30/70)	None	60/0 /40	Medium	>20 Min.	24	NF
11	"F-12"/"F-11" (30/70)	Kerosene	60/20/20	Medium	>20 Min.	18	NF
12	"F-12"/"F-11" (30/70)	Kerosene	60/30/10	Medium	>20 Min.	16	FS

#### TABLE III. EMULSION SYSTEMS PRODUCING COARSE SPRAYS

Emulsifying Agent: 2 parts by weight of "Emcol-14"

No.	"Freon" Propellent	Auxiliary Solvent	Composition in Parts by Weight, Prop./Solvent/Water	Spray	Separation Time	Pressure at 70°F., Psig	Flam- mability*
13	"F-12"/"F-11" (30/70)	Kerosene	40/20/40	Coarse	5-10 Min.	16	NF
14	"F-12"/"F-11" (20/80)	Kerosene	60/20/20	Coarse	>20 Min.	12	NF
15	"F-12"/"F-11" (30/70)	None	40/0 /60	Coarse	>20 Min.	24	NF
16	"Freon-12"	Kerosene	20/30/50	Coarse	>24 Hrs.	34	FL
17	"Freon-12"	Kerosene	20/40/40	Coarse	>24 Hrs.	28.5	FS
18	"F-12"/"F-114" (15/85)	Mineral Oil	40/20/40	Coarse	10-20 Min.	23.5	FL
19	"F-12"/"F-11" (30/70)	None	30/0 /70	Very Coarse	>20 Min.	24	NF
20	"F-12"/"F-11" (30/70)	Kerosene	40/30/30	Very Coarse	>20 Min.	13.5	FL
21	"F-12"/"F-11" (20/80)	Kerosene	60/30/10	Very Coarse	>20 Min.	10	NF
22	"F-12"/"F-114" (15/85)	Mineral Oil	40/30/30	Very Coarse	10-20 Min.	21	FL
23	"F-12"/"F-11" (30/70)	None	20/40/40	Stream	2 Min.	24	NF
24	"F-12"/"F-11" (20/80)	Kerosene	40/20/40	Stream	>24 Hrs.	10	NF
25	"F-12"/"F-114" (15/85)	Mineral Oil	40/30/30	Stream	>30 Min.	17	FL

\*NF = Nonflammable FL = Flammable FS = Flame Sustaining

typical water-in-oil aerosol spray product follows:

#### Antiperspirant Formulation

Antiperspirant	Formulation
	Percent by Weight
Aluminum Chlorhydrate	12.5
Water	12.5
Emcol® 14	2.5
Glyceryl Monostearate	2.5
Isopropyl Myristate	1.0
Propellent Mixture*	69.0
	100.0

\*15% dichlorodifluoromethane and 85% tetrafluorodichloroethane

The propellent is pressure filled.

With both the oil-in-water and the water-in-oil emulsion type formulations, it is necessary to use a "mechanical break-up" type of valve actuator.

Tables I, II, and III' show various types of emulsion systems using two parts by weight of Emcol® 14. It will be noted that emulsion separation times are relatively short and, therefore, the container would have to be shaken before use.

In the presence of kerosene the water in these formulations did not seem to affect the flammability of the complete formulation. The product would be non-flammable when twenty parts by weight of flammable solvent was present. When the flammable solvent concentration was thirty parts, the product was flammable, and at forty parts of flammable solvent, the product was flame sustaining.

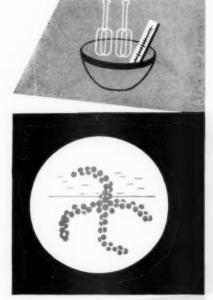
Spray characteristics of these products can be varied from a stream to a fine spray depending on the amount of propellent and the amount of solvent.

The emulsions are formed by adding the water containing the active material to the solvent solution of the emulsifying agent. The smaller the aqueous particles, the more stable will be the emulsion. As in conventional manufacture of emulsions, the method of agitation is of prime importance. When the emulsion has formed it can be placed in the container and the valve crimped on. The propellent is then pressure filled through the valve and, since it is part of the "outer" phase, merely dilutes the emulsion.

The use of these various emulsion systems in aerosol products will, with suitable formulations, expand the number of aerosol products both spray and foam that can be successfully marketed in the cosmetic industry.

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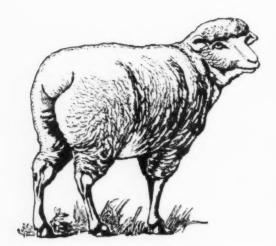
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# Emulsifying Properties of Lanolin Derivatives



Mr. Conrad is executive vice president and technical director of American Cholesterol Products Inc. of which he was one of the founders in 1939. He was graduated from Brooklyn Callege with a B. S. degree in 1933 and then pursued graduate studies in various universities working under a grant from the Schering-Glatz Drug Co. investigating the sensitization of animal tissues to the texic end products of several drugs. He has also conducted research in pharmacology but for the post 18 years he has specialized in lanoilin and sterol chemistry. He has been a member of the Society of Cosmetic Chemists since 1947 and is a member of the American Pharmacoulical Society, the New York Academy of Science and the American Chemical Society, the New York Academy of Science and the American Assn. for the Advancement of Science. He is the author and co-author of many patents and published studies presented before scientific societies. He is the co-author of a chapter on Sterols and Sterolds in Vol. 12 of the Encyclopedia of Chemical Technology.



#### LESTER I. CONRAD

The use of lanolin derivatives for various applications in cosmetics and toiletries has increased markedly in recent years following general recognition of the beneficial properties of these substances. Knowledge of their specific behavior in various types of dispersed systems is essential to achieve desired physical properties, stability and effectiveness in emulsified products. The purpose of this presentation is to classify the various lanolin-derived products on a simple chemical basis and to relate their structure to emulsifying properties.

Although the composition of lanolin was ill-defined until just a few years ago, the nature of this complex substance is now fairly well established. The detailed chemical information available on the lanolin esters, alcohols and acids is the basis for the development of more effective products from lanolin and its components.

The chemistry of lanolin has been reported in considerable detail in recent publications and reviews (1, 2, 3) and need not be covered further herein. However, a brief description will be of assistance in understanding the structure of the various derivatives presented below. Lanolin is composed mainly of esters consisting of sterols, aliphatic alcohols and triterpenes, and an approximately equal weight of fatty acids. There are also present small percentages of free fatty acids, free alcohols, and hydrocarbons (see Fig. I).

The lanolin esters, although comprising approximately 94% of lanolin, are practically devoid of emulsifying powers (1, 4). The valuable emulsifying properties of the alcohols are well established but the importance of the fatty acids as emulsifiers is just becoming recognized (3, 4). These unusual acids contain, besides normal acids, a high percentage of interesting branched-chain and hydroxy acids. It is now clear that the reputation of lanolin as a w/o emulsifier must be credited to the free alcohols with some help from the small per-

centage of free fatty acids which are present in the natural product.

Lanolin derivatives are not limited in chemical comosition (and consequently in function and effect), as is U.S.P. lanolin. Chemists working in this field have applied their recently acquired knowledge of the constitution of lanolin with ingenuity and imagination to develop a large number of derivatives which achieve specific effects when formulated in emulsions. The new derivatives may retain in modified form, the w/o emulsifying properties of lanolin. Conversely, some of these products bear little resemblance in emulsifying activity to the parent substance and have to be treated as entirely new surface-active agents of the o/w type. In addition, other lanolin derivatives (such as the synthetic hydrophobic lanolin alcohol esters) have been prepared which although indifferent emulsifiers, can bring about profound changes in emulsion stability, pigment dispersion and suspension and in latent gelling properties of emulsions. Such products modify the interfacial dynamics of dispersed systems and act as auxiliary emulsifiers in both o/w and w/o emulsions.



Various natural and synthetic substances have been chemically reacted with lanolin and its components to alter the traditional emulsion characteristics of this natural wax derived from the wool of sheep. Among these are ethylene oxide, castor and other vegetable oils, lower alcohols, unsaturated fatty acids, carbohydrate-derived keto-acids, acetic and propionic acids, etc.

It is unfortunate that at this time HLB values are not available for the great majority of lanolin derivatives and therefore none have been included herein. It is hoped that a list of HLB values for these products can be prepared soon and made available to those who utilize

this system in their formulation studies.

It should be noted that the term lanolin derivative is used herein in its broadest sense to include all products derived from lanolin, whether true chemical derivatives or products of fractionation. Thus, liquid and wax fractions of lanolin, cholesterol, lanolin acids and lanolin alcohols are classed herein as derivatives although strictly speaking they are fractions, chemically unmodified.

### Table I

# CLASSIFICATION OF LANOLIN DERIVATIVES

### I. TOTAL LANOLIN DERIVATIVES

- a. Liquid lanolin, lanolin wax
- b. Acylated lanolin
- c. Hydrogenated lanolin
- d. Ethoxylated lanolin
- e. Isopropyl lanolin derivative

# II. LANOLIN ALCOHOLS AND DERIVATIVES

- a. Cholesterol
- b. Lanolin alcohols B.P.
- c. Lanolin alcohol extracts
- d. Absorption bases
- e. Synthetic esters of lanolin alcohols
- f. Ethoxylated lanolin alcohols

# III. LANOLIN ACIDS AND DERIVATIVES

- a. Free fatty acids
- b. Synthetic esters
- c. Soaps

The following discussion of lanolin derivatives purposely omits references to other valuable characteristics of these materials, reviewing only their emulsifying properties.

# I. TOTAL LANOLIN DERIVATIVES

a. Liquid Lanolin, Lanolin Wax

The various liquid and wax fractions of lanolin which are currently available resemble lanolin U.S.P. very closely in their performance as w/o emulsifiers. While the fluidity of liquid lanolin and its lack of waxy components is advantageous in some respects, in emulsions it is not distinguishable from lanolin to any marked degree. Lanolin wax can be used as a viscosity builder of the oil phase in o/w as well as in w/o emulsions. However, cosmetic technologists will recognize that when either of these lanolin fractions are used in o/w emulsions, sufficient surface-active agent must be present to maintain stability by counteracting the w/o tendency of these products. This is also true in foams and aerosol emulsions.

b. Acylated Lanolin

Acetylated and propionylated lanolin illustrate the type of derivative in which the free hydroxyl groups of lanolin are reacted with organic acids (5, 6). The induced chemical changes in molecular structure cause the acylated products to become far more hydrophobic than



Stainless steel kettles by Lee Metal Products Co. Photo courtesy of Charles of the Ritz

lanolin and effect a dramatic change in emulsifying properties, although retaining non-ionic character. These derivatives no longer act as w/o emulsifiers, although they may be used in this type of emulsion with primary w/o emulsifiers such as other lanolin derivatives or sorbitan fatty acid esters. Acetylated derivatives of lanolin do not oppose o/w emulsification and exhibit unexpected activity at the interface in o/w emulsions, soaps and foams. They are readily dispersed in these systems and are excellent stabilizers for many types of emulsified products including cream shampoos and aerosol preparations.

c. Hydrogenated Lanolin

Since hydrogenation reduces practically all of the fatty acid constituents of lanolin esters to alcohols, a marked increase in w/o emulsifying properties would be expected. A commercially available product of this type is stated to have nearly  $1\frac{1}{2}$  times more water absorption capacity than lanolin (7). It is possible that some of the original alcohols are chemically changed by this process since the free cholesterol content,  $1\frac{1}{2}-2\%$  cited by the manufacturer (8), is far below the theoretically expected percentage. A reduction process developed by the Eastern Regional Laboratory, U. S. Department of Agriculture, resulted in a reduced lanolin product with a free cholesterol content of 25.4% (9).

d. Ethoxylate Lanolin

Ethoxylation is a convenient way of imparting hydrophilic properties to lanolin. As the ethylene oxide content increases, the product becomes more water soluble and more surface active (non-ionic). As would be expected, there is a reversal of the usual lanolin emulsifying properties to o/w as the ethylene oxide chain increases in length.

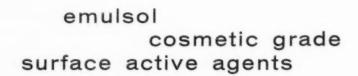
The ethoxylated derivatives of lanolin are useful mainly in emulsions of the o/w type either as the sole emulsifier or in conjunction with others in creams, lotions and aerated products. By reacting polyoxyethylene sorbitol with lanolin, hydrophilic lanolin derivatives have been obtained which are also o/w emulsifiers. These too may be used in w/o emulsions in conjunction with other emulsifiers. They, according to Griffin et al, "may be used as low efficiency solubilizers for essential oils" (10).

e. Isopropyl Lanolin Derivatives

By partial transesterification of lanolin with isopro-







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panol a mixture consisting of unreacted lanolin, lanolin alcohols and isopropyl esters has been obtained. The resulting product possesses limited w/o emulsifying power 11 in spite of the high content of unreacted lanolin. This may be due to the counter-balancing effects of the various compounds in the mixture. When used in emulsions, stabilization can be achieved by formulating with primary o/w or w/o emulsifiers, as the case may be.

### II. DERIVATIVES OF LANOLIN ALCOHOLS

a. Cholesterol

This sterol is the best known of the wool wax alcohols. Many of the classic physical-chemical studies on o/w emulsion stabilization have been carried out with pure cholesterol. It is primarily a w o emulsifier, but its high m.p. (147°C), poor solubility and a tendency to crystallize in emulsions when used in pure form, have limited its use. Fractional percentages of cholesterol are sometimes sufficient to stabilize o/w emulsions although mixed sterols, such as found in lanolin alcohols, are more effective for this purpose.

b. Lanolin Alcohols B.P.

This product has been listed in the British Pharmacopeia for many years but its use in cosmetic emulsions in the U.S. A. has not been widespread, possibly because the natural variation in composition to which landlin is subject, is amplified in the alcohol fraction. Although many lanolin alcohols are good emulsifiers, some of them tend to break rather than stabilize w o emulsions. Tiedt and Truter (4) point out that several of the alcohol fractions have poor emulsifying properties and are poor emulsion stabilizers. Among these are the normal monohydric alcohols, cholestanetriol, 7-oxocholesterol and a residual fraction (polycyclic alcohols). Thus the ratio of emulsifying to counter-emulsifying effects in this total alcohol fraction will change as these fractions vary in concentration, making uniform performance as w/o emulsifier and as stabilizer for o/w emulsions very difficult to obtain. The use of auxiliary surfactants in sufficient concentration to carry a sensitive emulsion system past the critical point of stability is often necessary.

c. Lanolin Alcohol Extract
Uniform multi-sterol extracts of selected lanolin alcohols are available in both liquid and solid forms. These extracts, having been freed of alcohols which have a "destabilizing" effect on emulsions, are dependable in performance, and are excellent w/o emulsifiers as well as stabilizers for o/w systems. The extracting media are hydrocarbons of the petrolatum or mineral oil types and there should be no volatile constituents in the finished products. These extracts of mixed lanolin alcohols give better results as emulsifiers for w/o than individual pure components. Strianse describes one of these lanolin alcohol extracts as possessing "remarkable surface-active properties in addition to being an excellent emollient." (12).

The lanolin alcohol extracts reduce interfacial tension almost to zero. They are important stabilizers in o/w emulsions where they function at the interface of the dispersed oil droplets by toughening the interfacial film. They are the most surface active of the entire lanolin family and are the basis for many of the so-called absorption bases described below.

d. Absorption Bases

Absorption bases contain free lanolin alcohols and sterols combined with sterol esters or lanolin (or both) in a hydrocarbon base. They emulsify water to form w/o emulsions of varied stability, water take-up, and body, depending on the ratio of alcohols to lanolin and the con-

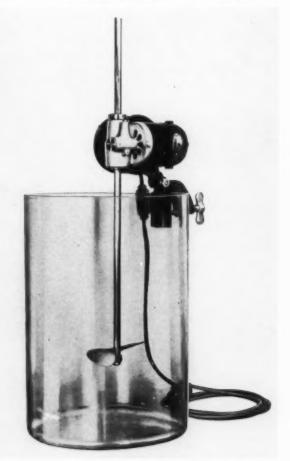
tent of inert hydrocarbons. The w/o emulsifying effect is largely a function of the activity of the free alcohols and this in turn (as in the lanolin alcohol extracts) is dependent on the degree of separation of surface active sterols and other alcohols, from the "depressing" groups. The more active absorption bases are also effective stabilizers for o/w emulsions when used in low concentrations.

Absorption base w/o emulsions are characterized by fine texture and elegant surface sheen. These require careful formulation, especially in the lotion viscosity range, to obtain good shelf stability. In this regard auxiliary agents such as sorbitan sesquioleate, beeswax-borax and metallic soaps are helpful. The many excellent w/o lotions on the market attest to the skill of the formulator in stabilizing this popular type of lotion.

e. Synthetic esters

These esters comprise some of the latest developments in the field of lanolin chemistry. Many types of esters of lanolin alcohols have been recently introduced, each with specific functions in mind. As one would expect from our knowledge of the emulsifying activity of the natural lanolin esters, these synthetic esters are likewise incapable in themselves of forming stable w/o emulsions, although they are incorporated in these emulsions without difficulty by using primary w/o emulsifiers.

In addition, esters of lanolin alcohols such as the acetate (13), ricinoleate (13), linoleate (13), para-aminobenzoate (13), and keto-acid (sugar-derived) derivatives (13), are readily dispersed in o/w emulsions as



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part of the oil phase in which they are soluble.

In most cases the stability as well as appearance of emulsions are affected by the presence of these esters. A good example of this is the effect of acetylated lanolin alcohols on the viscosity stability of both o/w and w/o lotions. This is believed to be due to inhibition of gelation and crystallization which, when it occurs at the o/w interface, results in undesirable thixotropic changes during aging.

f. Ethoxylated Lanolin Alcohols

By reacting lanolin alcohols with ethylene oxide, water-soluble surface-active ethers can be obtained. Their properties vary with the number of mols of ethylene oxide in the molecule, but in general the products are o/w emulsifiers which have interesting solubilizing effects on water insoluble substances such as fats, oils, perfumes, vitamins and pharmaceuticals. By varying the balance between the relatively hydrophobic lanolin alcohols and the hydrophilic ethylene oxide chain, these condensates can be made to fit the requirements of a particular emulsion system. Several products of this type are available.

Another series of products has recently been made available which contain ester groups in addition to ether groups. These ester-ether derivatives of lanolin constituents are the result of both polyethoxylation and acetylation of lanolin alcohols and hydroxyesters (13). The resulting products, which are liquids, retain the water solubility and o/w emulsification properties of the simple ethers described above, but the increased hydrophobicity resulting from acetylation is apparent in the interfacial effects. Increased solubilization powers for various water insoluble substances and marked substantivity for skin and hair are concomitant effects of the changes in surface-activity brought about by acetylation. An interesting application is the preparation of unusually "active" emulsions by solubilizing oil soluble materials such as antiseptics, perfumes, liquid lanolin, drugs, etc. in the water phase by means of these derivatives. If at the same time these materials are dissolved in the oil phase as well, increased effectiveness is obtained by making these oil-soluble substances simultaneously available from both phases of the emulsion.

# III. LANOLIN FATTY ACIDS AND DERIVATIVES

a. Free Fatty Acids

Although lanolin free fatty acids suitable for cosmetic use are not yet commercially available, these have been prepared experimentally and exhibit good w/o emulsifying properties. As previously indicated these contribute to the emulsifying ability of lanolin.

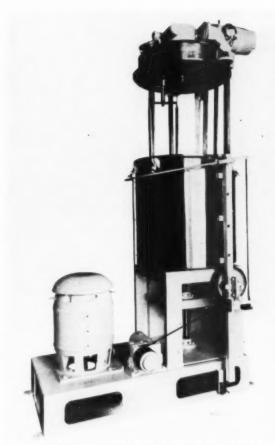
b. Synthetic Esters of Lanolin Fatty Acids

A recently developed isopropyl ester of lanolin fatty acid (13) is expected to become an important member of the lanolin emulsifier family. Isopropyl lanolate is a 100% active semi-solid product which takes up water readily to form soft, stable w/o emulsions with none of the tacky or gumminess of lanolin. These emulsions have unusual spreading, emollient, and apparent penetrating properties. Isopropyl lanolate may also be used in o/w emulsions where it functions in low concentrations as a stabilizer.

c. Soaps of Lanolin Fatty Acids

A product described as "a substituted alkylamine of selected lanolic acids" (14) is available for use in shampoos, soaps and other cleansing preparations. This is an anionic type of derivative with surface-active properties quite different from the non-ionic lanolin derivatives described above.

Various other soluble soaps of lanolin fatty acids have been prepared experimentally. It is to be expected that the recently developed methods of obtaining the lanolin



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fatty acids in their natural form (3), with hydroxyl groups and branched-chains intact, will lead to many new derivatives of these acids.

On reviewing the emulsifying properties of lanolin derivatives one is impressed with their wide range of activity in both o/w and w/o systems. Although stabilization of an emulsion usually implies just lack of separation, much more is necessary to produce an elegant, functional and marketable preparation. Viscosity, gloss, texture, pigment suspension, moisture-holding ability, spreading properties, penetration, occlusiveness and even emollience, are all influenced by emulsion type and stability. Each derivative has a definite effect on the aforementioned properties of emulsions. Many of these lanolin-derived products introduce outstanding qualities which are not reproducible by other types of emulsifiers.

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Photo Courtesy of Harriet Hubbard Ayer, Inc.

# Newer Formulations Containing



# **Lanolin Specialties**

M. G. DENAVARRE

N o discussion of emulsions is complete without including lanolin. Yet lanolin is a poor emulsifier by itself. Many of its derivatives are little better.

The principal producers of lanolin derivatives in the U. S. and one British company with international ramifications were invited to contribute *four* cosmetic formulas each, showing the use of their lanolin specialties. Each formula is offered without warranty. For further data write directly to the supplier.

# American Cholesterol Products

# ANIONIC ALL PURPOSE LOTION, o/w

* AMERCHOL L-101	8.09
* ACETULAN	1.0
stearic acid	2.5
glyceryl monostearate C	2.0
mineral oil (70 vis)	4.5
propylene glycol	4.5
triethanolamine	1.0
water	76.5
preservative & perfume	q.s.
* American Cholesterol Products, Inc.	

# Procedure

Emulsify by adding the water phase to the oil phase (both at  $85^{\circ}$ C) and stir at moderate speed to avoid aerating. Continue mixing until about  $40^{\circ}$ C, add preservative and perfume. Mixing is continued until batch is at room temperature. Remix the next day if desired.

# NON-IONIC HAIR DRESSING CREAM, w/o

* AMERCHOL L-101	6.0%
* RICILAN B or C	1.0
mineral oil (125 vis)	25.0
microcrystalline wax (170° m.p.)	5.0
white petrolatum	5.0
aluminum monostearate	1.0
Arlacel 83	0.2
glycerine	5.0
water	51.8
preservative & perfume	q.s.
* American Cholesterol Products, Inc.	

### Procedure

Disperse the aluminum stearate in mineral oil at room temperature. Heat to at least 85°C as required for solution and gelling. Add the remainder of the oil phase ingredients and continue heating until clear. Adjust to 70°C and emulsify by adding the water phase (water and glycerine) to the oil phase, both at 70°C. Mix at

moderate speed and cool to  $30\,^{\circ}\mathrm{C}.$  Allow to stand overnight and then remix.

### ANIONIC EMOLLIENT CREAM o/w

* POLYLAN	1.0%
*AMERCHOL L-101	6.0
* MODULAN	2.0
glyceryl monostearate C	12.0
petrolatum	4.0
mineral oil (70 vis)	5.0
stearic acid XXX	2.0
glycerine	5.0
water	62,5
sodium lauryl sulfate	0.5
preservative and perfume	q.s.
* American Cholesterol Products, Inc.	

# Procedure

Emulsify by adding the water phase at 85°C to the oil phase at 85°C, and mix until 40°C. Add preservative and perfume. Continue mixing until cool.

# NON-IONIC ANTIPERSPIRANT LOTION, o/w

Oil phase:	* SOLULAN 98	2.0%
	* AMERCHOL L-101	4.0
	cetyl alcohol	1.5
	glycerine	2.0
	Myrj 52	4.0
	stearic acid XXX	2.0
Water phase:	Veegum HV	1.0
	water	47.5
	Chlorhydrol 50% soln.	36.0
Chlorhydrol:	perfume and preservative	q.s.
	* American Cholesterol Produc	ts, Inc.

### Procedure

Combine all oil phase ingredients and heat to  $65^{\circ}$ - $70^{\circ}$ C. Add Veegum, well dispersed in water, at  $70^{\circ}$ C to the oil phase with moderate mixing. Cool to  $40^{\circ}$ C and add the 50% solution of Chlorhydrol. Continue cooling with slow agitation to room temperature. Remix the following day.

# Croda Ltd.

# HAIR CREAM (O/W)

	Polawax. Emulsifying wax	35.0
	Olive Oil	25.0
A.	Lanolin	25.0
	White Petroleum Jelly	11.0
	Liquid Paraffin	35.0

Cosmetics

THE UNSEEN INGREDIENTS IN PRODUCTS SEEN EVERYWHERE

SONNEBORN

# WHITE OILS PETROLATUMS

For more than half a century Sonneborn has helped manufacturers maintain the confidence of their customers by its own constant research activities and by its development work with manufacturers in the production of better finished products through the more effective use of white oils and petrolatums. This dual effort has resulted in ever better products for both Sonneborn and its customers.

Sonneborn L. SONNEBORN SONS, INC., NEW YORK 10, N. Y.

B. Sodium Lauryl Sulphate 0.5 Water 45.0

Method of Manufacture

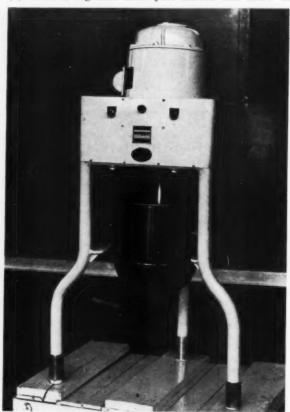
(1) Heat A to  $70^{\circ}$ C. (2) Bring B to  $70^{\circ}$ C. (3) Add A to B slowly with moderate, but thorough agitation, stir until cold. Perfume at  $40^{\circ}$ C.

# CLEANSING CREAM (W/O)

~ ~		
	Lanolin	8.0
	Hartolan. Wool Wax Alcohols	3.0
A.	Spermaceti Wax	4.0
	Cetyl Alcohol	5.0
	White Beeswax	6.0
	White Mineral Oil	25.0
B.	Water	49.0

Method of Manufacture

(1) Heat A together until just melted and allow to



Votator Viscoblender for mixing in medium viscosity ranges

cool to about 50°C. (2) Heat B to 50°C. and add to A. Agitate with a paddle type mixer until cold. Perfume at 25-30°C.

# LIQUID HAND CREAM (O/W)

	Cerawax	3.0
A.	Isopropyl Myristate	12.0
	Oleic Acid	0.5
	Fluilan Liquid Lanolin	4.0
	Triethanolamine	0.25
В.	Glycerine	2.5
	Water	90.0

Method of Manufacture

(1) Heat A to 65-70°C. (2) Bring B to 60°C. (3) Add A to B with high speed agitation, stir until cold. Homogenise Perfume at 25°C.

# VANISHING CREAM (O/W)

	Stearic Acid (T.P)	10.0
	Polawax. Emulsifying wax	1.0
A.	Isocreme. Absorption Base	3.0
	Diglycol laurate	1.0
	Glyceryl monostearate (S.E)	2.0
	Mineral Oil	1.0
	Glycerine	2.0
B.	Potassium Hydroxide	1.0
	Water	79.0

Method of Manufacture

(1) Heat A together to a temperature of  $75^{\circ}$ C. (2) Heat B to the same temperature. (3) Add B to A with constant agitation, stir until cold. Perfume at  $40^{\circ}$ C.

# Fanning Chemical Corp.

Formulas with these Lanolin derivatives:

VIGILAN (Lanolin Oil)

LANWAX #120 (Lanolin Wax)

LAN-AQUA-SOL (Water Soluble-Ethoxylated Lanolin)

# LIQUID HAND CREAM—containing VIGILAN (Lano-

1 (111)	
VIGILAN (Lanolin Oil)	6.0%
Glyceryl Monostearate	13.0%
Glycerin	7.0%
Sesame Oil	3.0%
Isopropyl Myristate	1.0%
Water	70.0%

Procedure: Mix glycerin and Water to a temperature of 165°F. In a separate container melt balance of components to 165°F. Add water-glycerin solution slowly to oils with continuous agitation. Continue mixing till cool.

# **EMULSIFIERS**

HYDROLAN, 100% hydrogenated Lanolin self emulsifying

COLESTERAL Hydrocarbon emulsifier

EMULSIFIER "B.B.C." Perfect emulsifier for brilliantines

EMULSIFIER "W.A.F." For emulsifying permanent-wave solutions

PROMULSO No. 4099 Emulsifier for pharmoceutical proparations

ESPERIS s.a. via Ambrogio Binda, 29 Milano, Italy Coble: Fayaud-Milano AMERICAN LANOLIN CORP.
13 Railroad Street
Lawrence, Mass.
U. S, Representative

# MYSORE SANDALWOOD

OIL



Genuine Mysore Sandalwood Oil, distilled at our Linden, N. J. plant, is the chosen standard of purest quality by all leading Perfumers.

# R. D. WEBB & CO., Inc.

137 Boston Post Road, Cos Cob, Conn.

Tel. TOwnsend 9-8363 or dial WEstmore 7-3424

# HAIR STICK—containing LANWAX #120 (Lanolin Wax)

LANWAX #120 (Lanolin Wax)	11.5%
Paraffin Wax	4.0%
Isopropyl Palmitate	9.5%
Petrolatum	70.0%
Cetyl Alcohol	5.0%

Procedure: Melt cetyl alcohol, paraffin wax and petrolatum and LANWAX, and add isopropyl palmitate, mixing thoroughly.

# AFTER SHAVE LOTION—containing LAN-AQUA-SOL (Water Soluble Lanolin)

LAN-AQUA-SOL (W/S Lanolin)	5.3%
Alcohol	19.0%
Hexachlorophene	0.2%
Menthol	0.3%
Benzocaine	0.2%
Water	75.0%

Procedure: Dissolve hexachlorophene, menthol and benzocaine in alcohol; mix LAN-AQUA-SOL 50% with water. Add water solution to alcohol solution, mix thoroughly, age and filter.

# LIQUID CLEANSING CREAM—containing VIGILAN (Lanolin Oil)

VIGILAN (Lanolin Oil)	6.0%
Stearic Acid	3.0%
Triethanolamine Lauryl Sulfate	2.0%
Glycerin	1.0%
Isopropyl Myristate	18.0%
White Mineral Oil	3.0%
Olive Oil	5.0%
Water	62.0%

Procedure: Dissolve Triethanolamine Lauryl Sulfate and Glycerin in water and heat to 170°F. In a separate container heat remaining components to 170°F. Slowly add water solution to oils with continuous agitation. Continue agitation till emulsion reaches room temperature.

# The Lanaetex Products Inc.

# O/W EMOLIENT ALL-PURPOSE CREAM

Beeswax	13.0%
Petrolatum	12.0%
Mineral Oil Light Viscosity	20.0%
LANTOX 55	20.0%
Preservative	0.5%
Water	34.0%
Borax	0.8%
Parfuma	0.0

Heat the waxes and oils to 70°C. separately. Heat Water with Borax to 75°C. Add Borax solution to waxes and oil phase. The addition of water should be slow but the agitation should be continuous. Perfume added when the mixture reaches 50°C.

# LIPSTICK FORMULATION WITH LANTOX 110

OTICIS A ORIMCEDITATION	*** * * * *	TOTAL TOTAL TEL	,
LANTOX 110		7.0%	
Beeswax		8.5%	
Lanolin		3.0%	
Carnauba Wax		2.0%	
Candelilla Wax		5.0%	
Paraffin Wax		2.7%	
Castor Oil		57.0%	
Isopropyl Myristate		5.5%	
Bromo Acid		2.5%	
Lipstick Lake Colors		6.8%	
Perfume		q.s	

# IN COSMETIC ELEGANCE

with

# LANTROL— for

- The pure liquid lanolin
- Soluble in mineral oil and the skin lipids
- Penetrates and lubricates the stratum corneum and the hair shaft
- · Carries moisture in
- Puts a barrier to moisture loss in the skin

with

# LANFRAX - for

smooth emulsions

- · A new cosmetic wax
- The *high* melting point super lanolin
- · Unusual light color
- Freedom from odor
- · U.S.P. purity

and try

# LANFRAX - wsss

- The new ethoxylated lanolin
- Water soluble
- · High melting point

Write or phone for further information. Call on our Products Development Department for formula ideas.



259 PARKHURST STREET NEWARK 5, NEW JERSEY

TAIbol 4-2200

Melt the waxes to  $80^\circ$  -  $90^\circ C$ . separately. Grind Bromo Acid in oils. Next day add the waxes to the oil in melted form and bring the temperature to  $80^\circ C$ . Add lipstick color and perfume. Grind finally, cool and mold as required.

# MODERN EMOLLIENT MOISTURIZED CREAM

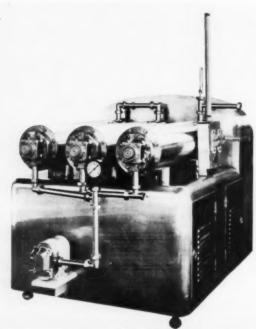
Beeswax	6.5%
Stearic Acid, Triple Pressed	2.0%
Span 40	2.5%
Span 60	2.5%
Mineral Oil Light Viscosity	20.0%
LANOILE	12.0%
Preservative	0.2%
Water	50.0%
Borax	0.8%
Triethanolamine	0.5%
Propylene Glycol	3.0%
Perfume	q.s

Dissolve the ingredients in water, bring the temperature to 80°C. Separately melt waxes and oils to 80°C. Pour water solution into the waxes. Use stirring or homogenizing at the temperature 65°-75°C. in order to obtain a smooth stable semi-liquid cream.

# BODY & HAND CREAM LOTION

et anni Citable Bollon	
LANOILE	5.0%
Propylene Glycol Stearate	4.0%
Stearic Acid-Triple Pressed	3.0%
Isopropyl Myristate	3.5%
Preservative	0.5%
Water	80.0%
Triethanolamine	1.0%
Glycerin	3.0%
Perfume	q.s.

Melt oils and waxes at a temperature 80°C. separately, water solution to 85°C. Add the water solution to the oil phase and keep the temperature for about 1 hour in order to saponify. During this time mix slowly and then faster in order to obtain a smooth emulsion. Perfume at a temperature of 50°C.



Votator Scraped Surface Heat Transfer Unit. The Girdler Co.



Eastern Industries' portable mixer for free flowing liquids which require large propeller surfaces operating at moderate speeds

# N. I. Malmstrom & Co.

# NIMLESTEROL MOISTURE CREAM 433/4

46.7
3.0
.2
1.0
10.0
16.0
2.0
8.0
8.0
.1
5.0
q.s.
100.0

\* Bareco Victory White 155

A. Add I to II, add perfume @  $50\,^{\circ}\text{C}.$  and agitate to  $40\,^{\circ}.$  Pour.

# HAIR CREAM (COLLAPSIBLE TUBES)

HAIR CREAM (COLEM SIDEE	I Chille	
Nimo Base 45-26 Modified	10.0	
Isopropyl Palmitate	5.0	
Tegosept M	.2	
Tegosept P	.1	Heat to 80°C
Cetyl Alcohol	10.0	1
Petrolatum	28.0	
Water	45.7	Heat to 80°C
Magnesium Sulfate	1.0	II
Perfume	q.s.	
-	100.0	

A. With moderate agitation, slowly add II to I.

B. Perfume at 50°C and stir to room temperature.

# AEROSOL HAIR SPRAY

Ethoxylan 100	1.5
PVP	2.0
Urea	1.0
SDA 40 Anhydrous	95.5
Perfume	q.s.
	100.0

# HAND & BODY LOTION 5-26/1

man & Bobl Bollon 9-20		
Arlex (Atlas Powder Co.)	2.5)	Heat to 75°C
Water ·	52.6)	I
Magnesium Lauryl Sulfate	3.6)	
Nimlesterol	5.0)	
Propylene glycol Monostearate	S.E. 5.0)	Heat to 75°C
Tegoasept M	.2)	II
Tegoasept P	.1)	
Myristyl Alcohol	1.0)	

Quince Seed Mucilage (3%) 30.0) Heat to 75°C III

Perfume & Color q.s.)

100.0

A. With moderate agitation slowly add I to II then add III.

B. Add perfume and color at 50°C and stir to 25 - 30°C.

# Robinson Wagner Co., Inc.

Formula 1.

ALCOLAN 40 is a lanolin derivative absorption base containing 6% to 7% cholesterol.

It is particularly suitable for use in hair grooming preparations and finds wide use in the manufacture of the currently popular, non-alcoholic cream hair oils.

Typical Formula

a)	ALCOLAN 40	14.25	parts
<b>b</b> )	Mineral oil (60 vis)	31.45	22
c)	Water	54.00	99
d)	Borax	0.30	99

### Procedure

- 1) Melt a and b together at 70°C.
- 2) Dissolve d in c at 70°C.
- Add #2 to #1 gradually, mixing until completely emulsified.
- Permit temperature to drop to 20°C and mix for half hour.
- Note: An excellent solid cream may be made by reducing the mineral oil content to 5 parts by weight. Formula 2.

ETHYLAN is a clear, golden yellow, oily liquid containing 35% by weight of unreacted lanolin dissolved in a lanoline derivative vehicle.

It is compatible with liquefied gas propellents and is extensively used as a plasticizing and conditioning additive in aerosol packaged hair sprays. Clear, stable solutions at 0°C are obtained with the following mixtures:

ETHYLAN 0 to 5% by weight PVP 0 to 10% " "
Ethanol balance

The optimum amount for an aerosol hair lacquer is within the range of 0.2% to 0.5% based on the total weight of the formulation.

# Formula 3.

LANOGEL 41 is a modified, water-soluble form of lanolin.

It is compatible with sulfated fatty-acid amides, esters and the amine salts of sulfated fatty alcohols. It is nonionic, resistant to hard water and is exten-



Pioneer-Central ultrasonic treatment container and companion generator which in effect produces the same process results achieved with the specially designed ultrasonic emulsifier.

sively used in hair shampoos where it functions as an effective emollient and foam stabilizer.

# Typical Basic Formula LANOGEL 41 2 parts

LANAMINE 20 "
Triethanolamine lauryl sulfate 35 "
Water 43 "

### Procedure

- 1) The first three ingredients listed, should be heated together at  $50\,^{\circ}\mathrm{C}.$
- 2) Add water (heated to 60° C) and mix gently.

### Formula 4.

LANOSOL is a lanolin sol containing 60% of pure lanolin colloidally suspended in a special lanolin derivative vehicle.

It facilitates the preparation of anhydrous liquid lotions with high lanolin content (35/35%) by the simple addition of mineral oil. LANOSOL lotions, prepared along the following lines, develop a unique, golden, translucent appearance, remain stable and possess superior emollient properties.

# Typical Formula

LANOSOL 55 parts Nuberak oil (350 vis.) 45 "

# Procedure

- Load ingredients into jacketed vessel equipped with efficient slow speed mixer.
- Mix at 25° C until complete uniform dispersion is attained.
- Reduce temperature of batch to 19° C and mix for half hour.

# **B-W LANOLIN U.S.P.**

EVENTUALLY-For better creams, with economy

B-W Lanolin the superior quality puts into your cream that which gives the skin that smooth soft velvety feeling.

B-W Lanolin will never cause your cream to darken, is best by test and contains over 15% free and combined Cholesterol.

No other base used in your cream, equals the merits of B-W Lanolin.

B-W HYDROPHIL (Absorption Base) Made in U.S.A.

# **BOPF-WHITTAM CORPORATION**

Executive Office, Laboratory and Factory: Linden, N.J.

America's Original Lanolin Producer ESTABLISHED 1914

Sales Office: 509 Fifth Ave. New York, N.Y.

# Malmstrom Chemical Corp.

"MOISTURIZING NIGHT CREAM	
LANTROL	10.00
Stearic Acid, Triple	
Pressed	1.50
Cetyl Alcohol	0.20
Mineral Oil 65-75 vis.	20.00
Beeswax	4.00
Span 60	5.00
Tegosept P	0.10
Borax	0.30
Glycerine	5.00
Triethanolamine	0.70
Water	52.00

Tween 60	1.00
Tegosept M	0.20
Perfume	q.s
	100.00

Heat both water phase and oil phase to 75°C. Add water phase to oil phase with rapid agitation. Stir down to about 40°C. to perfume.

LIA	ID	CRE	AM
111.75		UNE	27 LY I

LANTRO	L	60.00
Isopropyl	Myristate	100.00

Tegosept M	2.00
Tegosept P	1.00
Oleic Acid	27.00
Glyceryl Monostearate	
Pure	40.00
LANFRAX	10.00
Triethanolamine	13.00
Water	747.00
Perfume	q.s.
	1000.00

Heat both water and oil phase to about 75°C. Add water phase to oil phase with rapid agitation. Stir down to about 40°C. to perfume.



NIMCO LANOLIN ANHYDROUS (U.S.P.)

Pale Deodorized and Cosmetic Grades. Quality controlled and clinically evaluated using repeated insult patch testing procedure - to be NEITHER A PRIMARY IRRITANT, SKIN FATIGUER NOR SENSITIZER.

# NIMCO CHOLESTEROL EMULSIFIERS

1. Liquid Nimlesterol - A liquid non-ionic cholesterol emulsifier rich in cholesterol and its isomers. An emollient surfactant soluble in oils, water dispersible. Will help improve stability, texture and cosmetic elegance in addition to maintaining moisture balance in skin by virtue of its high water absorbing capacity. Clinically evaluated to be NEITHER A PRIMARY IRRITANT NOR SENSITIZER.

2. Solid Cholesterol Emulsifiers - A complete line of lanolin absorption bases, rich in cholesterol and its isomers, useful in preparing emollient creams and oils, cold creams, hand lotions and creams, lipsticks, hair conditioners, hair grooms, antiperspirants, shaving creams, suntan products.

# ETHOXYLAN 100 and 50

An improved water- and alcohol-SOLUBLE LANOLIN derivative. A non-ionic surfactant, foam enhancer, foam stabilizer, solubilizer, auxiliary emusifier. Clinically safe to be used in shampoos and hair preparations according to Draize, Woodward & Calvery rabbit eye irritation studies.

# LANOMAL

A free-flowing lanolin powder which may serve as a substitute for anhydrous lanolin in soap powder formulations.

# WOOL WAX ALCOHOLS B. P. (lanolin alcohols)

Natural self-emulsifying agent, wax and source of cholesterol for cosmetic and pharmaceutical formulations.

Illustrated brochure and data folders available.

# N. I. MALMSTROM &

America's Largest Processor of Wool Fat and Lanolin

147 Lombardy Street, Brooklyn 22, N. Y.

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COMMERCIAL CHEMICALS, INC. 36 Winthrop Street Rochester 7, New York

> R.I.T.A. CHEMICAL CORP. 612 No. Michigan Avenue Chicago 11, Illinois

# HAND CREAM (non-mineral oil)

(non-mineral oil)	,
LANTROL	5.00
Myristal Alcohol	1.00
Glyceryl Monostearate	
Pure	10.00
Tegosept P	0.100
Deltyl Extra	5.00
Water	72.70
Arlex	5.00
Tegosept M	0.20
Duponol WA Paste	1.00
Perfume	q.s.
	100.00

Heat oil phase and water phase to about 75°C. Add water phase to oil phase with rapid agitation. Stir down to about 40°C. to perfume.

# HAND AND BODY LOTION

011)
3.00
5.00
0.20
0.10
1.00
2.50
82.20
5.00
1.00
q.s.
100.00

Heat water phase and oil phase to about 75°C. Add water phase to oil phase with rapid agitation. Stir down to about 40°C. to perfume.

### Walter Wynne

Mr. Wynne is chief research chemist of Givaudan-Dalawanna Inc. with whom he has been associated for many years. He was graduated from Pratt Institute where he specialized in chemistry and allied sciences. He is chairman of the Arrangements Committee of the Society of Cosmetic Chemists and has been active in its affairs for years. He has contributed numerous technical articles to scientific journals.

# EFFECT OF PERFUME OILS ON EMULSIONS









The expression "stability of a perfume oil in a cosmetic emulsion" is sometimes rather confusing. It usually refers to the fact that the perfume will not change in odor character, or it may mean that it is stable against discoloration, but rarely if ever is it employed to mean having any effect on the stability of the emulsion itself. Very little work has been done to determine what effect a perfume oil has on the stability of an emulsion, probably for the very good reason that no serious detrimental effect has ever been noticed when the perfume is used in the usual concentration of 0.25% to 0.5%, based on the total weight of the emulsion.

During the war, due to the shortage of alcohol, the cream cologne was introduced, and the cosmetic chemist was made abruptly aware of the difficulties encountered in emulsifying perfume oils. In these thin creamy emulsions, the concentration of perfume oil ranged from 3 to 6%, and very few if any cream colognes were stable for any length of time. In instances when a formulation with one perfume gave indication of reasonable stability. separation would result in a few hours or a few days when other perfume oils were used. This was the experience of the Givaudan laboratory, experimenting during the war years with a great number of perfume compounds. Because of the difficulty of emulsifying these perfume oils in a concentration of 3%, it cannot be concluded that in a concentration of 0.25% they would have a disturbing effect on the stability of the emulsion. In fact, we know that many of the oils giving difficulty in cream colognes have been used for years in perfuming of creams and emulsified lotions.

### Purpose of the Project

The Cosmetic Research Laboratory of Givaudan-Dela-

wanna has experimented with the use of a wide variety of perfume compounds and perfume ingredients in different types of emulsions, and has been making observations and recommendations for many years. More recently a project was set up to determine if the stability of emulsions was affected by either perfume oils or the materials from which they are compounded. It was decided that this work would mean more if the effect of these oils was determined on a normally stable emulsion, rather than to determine if these oils hastened the separation of an unstable emulsion. In view of this fact, this project must of necessity be of long duration, but the observations given in this report cover an adequate period of approximately three months.

For testing, we selected five compounded perfume oils (two of rose character, a bouquet, a lilac, and a light floral type), five aromatic chemicals (synthetics and isolates), and three essential oils. Each material was tested in selected types of emulsions in concentration of 0.25%, 0.5%, and 1%, although a 1% concentration is rarely used in cosmetic creams and lotions of usual, well-known types.

# **Products Tested**

The list of thirteen products tested are as follows:

- 1. Rose Perfume A
- 2. Rose Perfume B
- 3. Bouquet Perfume
- 4. Lilac Perfume
- 5. Light-floral type Perfume
- 6. Phenyl ethyl alcohol
- 7. Geraniol Pure
- 8. Terpineol Extra
- 9. Hydroxycitronellal'
- 10. Amyl cinnamic aldehyde'
- 11. Rose de mai absolute
- 12. Geranium Bourbon
- 13. Lavender (50% ester content)

The next step in setting up this project was to decide on the number and type of emulsions. The possibility

<sup>\*</sup> Chief, Cosmetic Research Laboratories, Givaudan-Delawanna Inc. Reprinted from the Givaudanian

of any perfume material in the above concentration affecting the stability of a cold cream or vanishing cream seemed so remote that we excluded cosmetic creams from the test.

Tests were conducted on five liquid emulsions, one of which was thin in consistency, and the remaining four of a heavier viscosity. Four of these were of a greaseless type, and the fifth a high-concentration mineral-oil emulsion. In formulating these lotions, we used emulsifiers which are in general use in the industry. Two of the emulsions were formed by triethanolamine stearate, one by potassium stearate and quince seed mucilage, another using Sorbitan Monostearate<sup>2</sup> and Polyoxyalkylene Sorbitan Monolaurate<sup>2</sup>, and the fifth by the reaction of 2-methyl-amino-1,3-propanediol and stearic acid. There were therefore four emulsions with emulsifiers which were anionic in character, and one with non-ionic emulsifiers.

### Procedure Used

The following procedure was used. About 8,000 grams of each lotion were prepared, and from this, 100-gram samples weighted, to which was added the required amount of perfume oil being tested. The 100 grams of lotion, with perfume, was warmed on a waterbath under constant stirring, until the temperature of the lotion was 50° C. At this point, it was removed from the waterbath and placed on a regular stirring apparatus, and stirred at a constant speed for twenty minutes, by which time the lotion had returned to room temperature. It was then poured into two-ounce clear-glass bottles, and labeled. The bottles were filled to a point just below their shoulder, so that creaming would be observed if it occurred. Control samples of each lotion without perfume were given exactly the same treatment. The bottles of lotion were then put on a shelf, and observations were made daily for a short time, and then at regular weekly intervals. The complete results of these observations are studied in detail later in the article.

The following formulas were used for the five lotions:

LOTI	ON	No.	1

Portion A:	
Diethyleneglycol monostearate pure	2
Stearic acid T.P.	2
Cetyl Alcohol Pure	1
Isopropyl myristate <sup>1</sup>	10
Lanolin	2
Triethanolamine	1
Portion B:	
Water	82

This is a semi-greaseless lotion, very thin in consistency and, of course, poured very freely.

LOTION No. 2

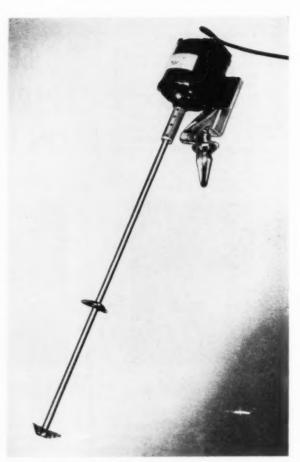
Portion A:	
Diethyleneglycol monostearate pure	2
Cetyl Alcohol Pure	3
Isopropyl myristate <sup>1</sup>	3
Sorbitan Monostearate <sup>2</sup>	1
Portion B:	
Poly-oxyalkylene Sorbitan Monolaurate	2 3
Water	88

This lotion is of the greaseless type, very heavy in consistency, and pours with difficulty.

LOTION No. 3

Portion A:	
Stearic acid T.P.	4.0
Cetyl Alcohol Pure	0.5
Isopropyl myristate <sup>1</sup>	6.0
Portion B:	
2-methyl-2-amino-1,3-propanedial	1.0
Water	88.5

This is a greaseless type of lotion, heavy in consistency, but pours easily.



Ertel Engineering Corp. Portable Mixer for free flowing liquids.

# LOTION No. 4

Portion A:	
Stearic acid T.P.	5.0
Isopropyl myristate <sup>1</sup>	4.0
Cetyl Alcohol Pure	0.5
Portion B:	
Potassium hydroxide	0.8
Water	59.7
Portion C:	
21/2 % Quince-seed mucilage	30.0

This is a greaseless-type lotion, heavy in consistency, but pours easily.

### LOTION No. 5

Portion A:	
Stearic acid T.P.	2.0
Lanolin anhydrous	2.0
Cetyl Alcohol Pure	0.5
Mineral oil viscosity 65-75	40.0
Triethanolamine	1.0
Portion B:	
Water	54.5

This lotion is a very greasy one, not very heavy in consistency, and pours easily.

# Results of Tests Described

The results of the observations on each lotion will first be described individually. The condition of the control sample will be reported, and then the perfume products tested are reported in three groups, namely the compounded perfume oils, the synthetic aromatic chemicals and isolates, and finally the essential oils.

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### Lotion No. 1

The triethanolamine stearate emulsion of thin consistency, showed no evidence of separation or creaming of the control sample.

Compounded perfume oils: None of these lotions showed any sign of separation or creaming. The five compounded oils tested, it will be recalled, included two of a rose character, one medium bouquet, one lilac, and one light-floral type.

Synthetic aromatics: Of the five products tested, terpineol in a 1% concentration was the only one which showed a separation, slight but definite, at the bottom of the bottle. The other products of this group tested were phenyl ethyl alcohol, Geraniol Pure, hydroxycitronellal, and amyl cinnamic aldehyde.

Essential oils: None of the oils in this group, rose de mai absolute, geranium Bourbon, or lavender (50% ester content), had any effect on this lotion, even in a 1% concentration.

# Lotion No. 2

The Sorbitan monostearate-Polyallsylene Sorbitan monolaurate emulsion of very heavy consistency, showed no evidence of creaming or separation of the control sample.

Compounded perfume oils: None of these lotions showed any indication of creaming or separation.

Synthetic aromatics: None of the lotions testing the oils of this group showed any indication of separation or of creaming in any of the concentrations.

Essential oils: This group of oils showed no ill effect on the lotions; they were all perfectly stable.

### Lotion No. 3

The amino-glycol stearate emulsion of heavy consistency but easy pouring, showed no evidence of separation or creaming of the control sample.

Compounded perfume oils: Rose perfume oil A<sup>1</sup> when tested in 1% concentration, showed a slight but definite separation at the bottom of the bottle. The 0.5% concentrations were perfectly stable. The lotions testing the other perfume oils showed no evidence of separation.

Synthetic aromatics: None of the products of this group had any effect on the lotion. The lotions were all perfectly stable.

Essential oils: This group of lotions showed no sign of separation.

# Lotion No. 4

The potassium stearate-quince seed mucilage emulsion of heavy consistency but easily poured, had control samples that were completely stable.

Compounded perfume oils: The lotion with 1% of light floral type perfume' showed slight separation at the bottom of the bottle. The lotions with the other two concentrations of this perfume oil, namely 0.5% and 0.25%, were completely stable. All the other test lotions of this group were completely stable.

Synthetic aromatics: Of this group, Geraniol Pure caused slight but definite separation in all three concentrations. Terpineol Extra caused slight separation in the 1% and 0.5% concentrations. The 0.25% concentration of Terpineol Extra showed signs of separation. All the other test lotions in all concentrations were completely stable.

Essential oils: No separation or creaming occurred in any of the test lotions of this group.

### Lotion No. 5

The triethanolamine stearate emulsion having a high mineral oil content, not very heavy in consistency and easily poured, showed a slight separation of the control within seven weeks, but this does not seem to have gotten worse on standing the longer period of three months.

Compounded perfume oils: The same slight separation as was observed in the control sample occurred in all test lotions of this group. The extent of separation seems to be consistent in all test samples, one no greater than the other.

Synthetic aromatics: The findings coincide with those on compounded perfume oils as were reported above.

Essential oils: This report is the same as that given above for the compounded perfume oils.

# Conclusions

In studying the results of these tests, we find that none of the essential oils tested in any concentration affected the stability of any of the lotions. They caused neither creaming nor separation of the emulsion. In fact, creaming did not occur in any of the test lotions.

In the case of the synthetic aromatics and isolates, the only one of the five different lotion formulations affected was the potassium stearate-quince seed emulsion. Geraniol Pure caused separation in all three concentrations, and Terpineol Extra caused separation in the 1% and the 0.5% concentrations. Light floral type perfume also caused separation in this emulsion, but only in the 1% concentrations, the other two being stable.

In the case of the compounded perfume oils, the only other separation was observed when Rose Perfume A' was used in a concentration of 1% in the amino-glycol-stearate emulsion.

When another rose perfume, namely Rose Perfume B<sup>1</sup>, was used, the stability of the emulsion was unaffected, even though the concentration was high. A mere comparison of the two formulas, without further tests, does not reveal any apparent cause of the different behavior in emulsions, as only minor differences, qualitative and quantitative, are seen.

This experiment particularly confirms the observation that had long been made in the Givaudan laboratories, that a perfume oil can be blended, regardless of desired odor character, that does not affect stability, and that is not the odor type, whether it be rose, violet, lilac, or an unnamed bouquet, that causes instability, but individual ingredients that may be present.

In the case of the quince-seed emulsion, the three separations reported were surprising to this laboratory because of the known stability of this type of emulsion; for we have stabilized cream colognes with the addition of 25% of this mucilage, and have known them to be stable for over eighteen months. This investigation will be continued, using other gums as a source of mucilage, and also using other soaps with quince-seed mucilage.

From this investigation, so far, it can be said that it is possible for a perfume oil in a 1% concentration to affect a liquid emulsion. The possibility of 0.25% concentration, which is the usual one for emulsified lotions, affecting its stability, seems more remote. However, of far greater importance, as in the case of the two rose perfumes, is the fact that if one perfume oil does cause separation, another of similar character can be made which will have no such effect.

The question of the possible effect of perfume oils on the emulsions is further minimized when we realize that the problem can be attacked from either of two angles first the formula of the perfume oil can be revised, or a different emulsion can be selected.



# MECHANICAL TREATMENT OF EMULSIFIED PRODUCTS



G. Kempson-Jones

Mr. Kempson-Jones is factory manager of the British branch of Max Factor & Co. and is recognized as an authority on production engineering problems.

# G. KEMPSON-JONES, F.R.I.C.

Because by definition an emulsion is a system containing two liquid phases, one of which is dispersed as globules in the other, it follows that the act of emulsification involves the addition and *intimate mixing* of one phase with the other.

Although it is the purpose of this paper to consider solely the mixing and mechanical treatment aspect of preparing an emulsified product, the composition of the two phases, particularly in respect of the emulsifying agent's selected, the order (which phase to which) and rate of addition, are all important factors affecting the final emulsion structure of the finished product. In this regard it cannot be too strongly emphasized that no amount of mechanical treatment of an emulsion can overcome fundamental weaknesses or faults of chemical formulation. In fact, experience has been that in some cases extremely efficient mixing has broken the very emulsion it was intended to improve. Quite apart from the fact that there are limits to the degree of movement or energy dissipation that favour globule dispersion rather than globule agglomeration, if the average globule size of the disperse phase of an emulsion is drastically reduced, a corresponding drastic increase in the interfacial surface area also takes place. This increase in interfacial surface area demands a proportionate increase in the availability of the emulsifying agent/s, which are responsible for the stability of the emulsion. If the chemical formulation has not made provision for the state of the emulsion after mechanical treatment, then such a product may well have its emulsion broken by a procedure intended to have a reverse effect.

The mechanical treatment of an emulsion may begin, in its simplest form, by means of the mixing paddles used to assist the addition of one phase to the other. Frequently this form of simple mixing is continued for a specified period of time after all the ingredients of an emulsified product have been added. Many emulsions are given no further treatment, and although the finished products are in some cases quite good, the fact remains that they may not be as good as they could be. In order to understand just why this should be so, it is nec-

essary first to appreciate that all emulsions are thermodynamically unstable. In consequence, the better the emulsion structure at the commencement of the life of a product, the longer will be its state of acceptable stability and appearance. The most dramatic way of demonstrating the value of efficient mechanical treatment is to observe under the microscope an emulsion which has not been mechanically improved, and then to compare its structure with a sample of the same emulsion after treatment. The untreated emulsion will be seen to possess a disperse phase comprising globules of very varying size. The same emulsion after treatment will be seen to possess dispersed globules of very even, and very small size. It is obvious that, because coalescence of the dispersed globules takes place with age (an emulsion's dynamic state) then the smaller the globules to begin with, the longer must be the shelf-life of the product. This particularly applies to liquid preparations, and by using very efficient mechanical methods, it is possible to break down the disperse phase of an emulsion so that the average globule size approaches the upper limits of colloidal dimensions, i.e. approximately 1 micron in diameter. This, of course, introduces an additional factor for stability, namely the so-called "Brownian movement."

Although emphasis has been given to the all important influence on shelf-life, improvement of an emulsion's structure involving a reduction in size of the dispersed globules also imparts visual benefits to the finished product. Higher gloss and whiteness are developed, as well as improved "body" and smoothness of texture. Furthermore, these properties are obtained not only in greater degree, but also with greater consistency, i.e. better batch-to-batch reproducibility.

The means by which an emulsion can be mechanically improved are many and varied, and not surprisingly, the results differ according to the amount of energy that is transmitted to the emulsion system, and the manner in which the energy is applied. Emulsifying mixers and machines are marketed under various descriptive titles, but most of them can be classified into one of the following three groups, according to the basic principle of their design:—

1. Mixing Impellers

- (a) Paddles (b) Propellers
- (c) Turbines
- 2. Colloid Mills
- 3. Homogenisers
  - (a) Pressure-valve
  - (b) Ultrasonic

In considering each type of apparatus in detail, some indication will be given as to the degree of emulsion improvement that can be expected under optimum conditions, and also the type of products that are best suited for a particular treatment. In this regard, it should be realized that in mechanically improving the structure of an emulsion, it matters little whether the emulsion be of an o/w or a w/o type, but that it is of considerable importance whether an emulsion be dilute or concentrated in respect of its disperse phase, whether its final rheological condition is of a liquid or a solid nature, whether it posesses a gel structure, and if so, over what temperature range it is operative. Although these are properties largely controlled by the particular chemical formulation, they nevertheless play a major part in the selection of an emulsifying machine for a particular product, and in the choice of optimum working conditions.

# Mixing Impellers

Paddle type mixing impellers are very limited in their ability to mechanically improve an emulsion, and, as has already been mentioned, their use is largely restricted to ensuring adequate circulation of the two phases during the act of emulsification. However, even for this operation attention should be paid to certain fundamental requirements in order to ensure satisfactory results. Mixing is caused by the effects of the kinetic energy imparted to the liquid by the passage of the paddles, which in turn produces entrainment at the margins of the different velocity streams so created. If no stationary objects are present (baffles) the flow pattern may quickly develop into a swirl in which the bulk of the liquid is moving without turbulence, and consequently with practically no mixing effect. It is for this reason that baffles are frequently fitted into mixing tanks. A counter-rotary paddle system is even more effective, as is also a planetary type paddle unit. Apart from paddle design and movement, the vessel shape is equally important in ensuring and maintaining a satisfactory flow pattern in a liquid-with-liquid system. Cylindrical shaped vessels are better than rectangular ones, and internally concave bottoms better than flat ones. Optimum ratios exist for diameter of impellers to diameter of mixing vessel, and also for depth of liquid to diameter of vessel. The simplest types of paddle mixers can operate only in freeflowing liquid systems, because in a viscous or paste-type emulsion, the flow patterns quickly die out due to the resistance to the transmission of kinetic energy. For a thick emulsion, only an efficient counter-rotary or planetary movement paddle system will produce satisfactory results. In general, however, it must be realized that a paddle mixing system gives very poor top-to-bottom flow.

Propeller type mixing impellers are widely used, but are limited in application to thin emulsions with good flow characteristics and freedom from gel structures. The propeller acts essentially as a screw, and the stream is discharged in a direction in line with the rotating shaft. The discharge stream remains cylindrical for an appreciable distance before it begins to spread out and develop into a circulating flow pattern. With high speeds of rotation, (up to 2,500 r.p.m.), in an emulsion of high fluidity, vortexing can be a problem. Vortexing represents not only a loss of motive power, but also a lowering of the efficiency of mixing. In extreme cases, the pro-

peller may actually be working in a pocket of air, and under such conditions, a considerable volume is drawn into the product. Particularly with emulsions, this latter possibility can be extremely serious. Entrained air can be trapped as a fairly stable foam which may lead to a breaking down of the emulsion. Vortexing can be avoided by using a larger diameter propeller at slower speeds, and also by moving the position of the stirrer so that it is out-of-centre to the mixing vessel. This change of position does disturb the symmetry of the flow patterns, but the consequent reduction in mixing efficiency is much less than that caused by severe vortexing.

Turbine or centrifugal type mixing impellers are modern developments of the propeller type. They are capable of exerting a reasonable degree of disruptive force on the disperse phase of an emulsion, and in consequence are capable of noticeably improving the texture and fineness of many emulsified preparations. As with propeller mixers, turbine types give very effective mixing because they generate flow streams which are directed towards the bottom or sides of the vessel with sufficient velocity, (in a non-viscous system) to produce good circulation and turbulence throughout the bulk. The turbine mixing head achieves its effects by the liquid being drawn upwards into the centre of the rotating unit, in which the rotating blades are mounted radially to the shaft, from which it is flung outwards by centrifugal force. The presence of an outer perforated stator ring in the mixing head ensures localized turbulence and intense shearing action, sufficient to cause an appreciable reduction in the average globule size of the disperse phase. This degree of mechanical improvement of the emulsion structure is only excelled by colloid mills and homogenizers. Because turbine and propeller mixers can be constructed as small, mobile immersion units, they lend themselves to batch processing, such that the mixing head can be immersed into the bulk product for a specified period of time, and can then be withdrawn and fitted to another vessel. This facility can bring about a high utilization factor for each high-speed mixing unit.

Variations exist in which a combination of two types of mixing devices are incorporated into a single machine for mechanically improving emulsions. Examples are the use of a high-speed impeller in the form of a multi-start thread in combination with a screen housing. Also a mixer embodying a paddle system, for crude primary mixing, together with a built-in turbine type emulsifying head. Another variant is the so-called "impelator," which achieves emulsion improvement by means of a high-speed disc, on the periphery of which is attached a series of differently-angled, tapered, open-ended tubes. Such a unit is capable of disrupting the disperse phase through the centrifugal and shearing forces applied in an area of intense turbulence.

### Colloid Mills

Colloid mills differ fundamentally from the impeller, immersion type mixing units that have so far been discussed, in that the emulsified product is passed through an emulsifying unit in which a controllable degree of disruptive energy is applied to only a very small amount of the product at any one instant of time. In consequence, a very high degree of emulsion improvement is possible, making colloid mills one of the best type of emulsifying machines available.

In its simplest form, a colloid mill comprises a coned rotor which runs at high speed in close proximity to a stator. The emulsion to be treated is fed from a hopper to the centre of the rotor, from whence it is flung outwards, through the narrow gap, by centrifugal force. The gap between the rotor and stator is adjustable, and for best results will usually only vary between 0.002-0.010

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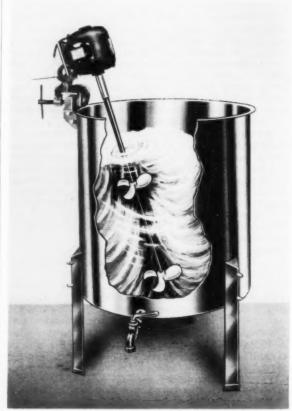
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inches. The rotor speeds differ according to the size of the mill, and hence the diameter of the rotor. Smaller mills may use speeds of up to 15,000 r.p.m., and the largest mill as low as 3,000 r.p.m. It is because the work on the emulsion is done at the periphery of the rotor, that the intensity of the shearing forces applied depends upon the rotational speed and the diameter of the rotor. Although the two main factors affecting the emulsifying efficiency of a colloid mill are the peripheral speed and the width of the gap between the rotor and stator, many variations in design of rotor and stator are possible, as well as a choice of surface materials. Several varieties of colloid mills are marketed, each possessing some feature of design or construction that may render it slightly more efficient for a particular emulsified product. Some mills have the axis of the rotor shaft in a vertical position, some horizontal. In general, a vertically mounted rotor shaft is perferable for fairly and very viscous materials, as this position facilitates both feed and discharge. Jacketed colloid mills are also available so that hot or cold processing is possible. This arrangement permits emulsion treatment to be carried out under optimum temperature and fluidity conditions, and is especially suitable for products which are solid or semisolid creams at normal temperatures. By the use of metering feed pumps, some products can be continually processed. With this technique, no prior formation of a primary emulsion is necessary, as emulsification takes place simultaneously with mechanical treatment.

### Homogenisers

The second group of emulsifying machines which are capable of achieving a great degree of emulsion improvement are those generally referred to as "homogenizers."



A "Hy-Speed" Portable Mixer clamped to a bracket on an Alsop Stainless Steel Tank.

As already indicated, these chiefly comprise the pressure-valve and the ultrasonic types.

Pressure-valve homogenizers are one of the oldest types of emulsifying machines, and are widely used in industry. As the name implies, the homogenizing effect is achieved by forcing the product through a special valve against a high pressure. Under these conditions, exceptionally high shearing forces are applied to small quantities of the emulsion, with consequent improvement in the fineness of the disperse phase. Some machines incorporate two or more valves in "series," and are frequently referred to as "two-stage" or "multistage" homogenizers. Depending on the particular emulsifying agents present, some products respond better to multi-stage processing, particularly in respect of the final flow characteristics.

The valves are usually spring-loaded and adjustable, so that the optimum degree of pressure can be selected for a particular product. Pressures of up to 3,000 p.s.i. are possible, and when applied to only a thin film of escaping liquid, reduction of the globule size of an emulsion to an average of less than 1 micron is readily obtainable. Variations in the design of the special valves are available, giving a selection in performance possibilities. Understandably different manufacturers apply somewhat descriptive names to their own specially designed pressure-valve homogenizers. Machines are varied in size, with capacities ranging from as little as 10 gal, per hour up to several thousands of gal, per hour. These homogenizers are suitable for processing not only cold liquid preparations, but also solid creams which can be liquefied with heat.

Latest in the field of emulsifying machines capable of exerting extremely high disruptive forces on an emulsion structure, is the so-called "ultrasonic" homogenizer.

The basic principle involved is that when a liquid is subjected to ultrasonic radiation, there are alternations of compression and rarefaction. This phenomenon, frequently described as "ultrasonic cavitation," is capable of applying tremendous disruptive force on the liquid in the immediate vicinity of the high frequency vibrations, and it is this almost explosive change of pressure which brings about an homogenizing effect on an emulsified liquid system. A commercial instrument embodying the ultrasonic cavitation principle, utilizes a sharp-

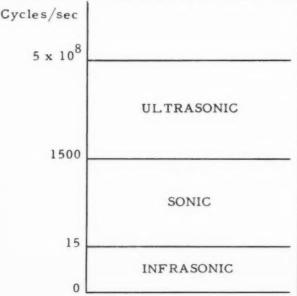


Chart of sound frequencies





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edged blade as the vibrating unit for producing high frequency vibrations. This blade is housed in a resonant bell, and when a jet of liquid is pumped into the housing it impinges onto the edge of the blade, thus causing the blade to vibrate at its own natural frequency of about 22,000 cycles per second. Waves of this frequency are just above the upper audible limit of the human ear, and are capable of exerting a disruptive cavitational force of about 30,000 p.s.i. It is not surprising therefore that such a homogenizing unit will reduce the average globule size of an emulsion to 1 micron or better. The largest machine at present available can process over 400 gal. of bulk liquid per hour. This instrument can be immersed into a premixed batch of an emulsion, or by the use of separate feed hoppers for each liquid phase, continuous processing is possible whereby the emulsification actually takes place in the resonant bell.

It should be appreciated that emulsification by ultrasonics is a comparatively new technique, and that the disruptive forces are applied under very different conditions as compared with other emulsifying machines of similar performance capabilities. Reformulation of a product is sometimes advisable for best results, and highly pigmented emulsified preparations can be troublesome. Good resulst are claimed for many liquid, free-flowing emulsions, whether processed hot or cold.

### Conclusions

In outlining the various mechanical methods that are available for the preparation and improvement of emulsions, no attempt has been made to describe individual machines. Each country in the Americas and in Europe has its own selection of mixing and emulsifying equipment, and it is hardly possible to adequately compare and assess performance potentials of similar types of

apparatus. The important thing is to be able to appreciate and understand the basic principles incorporated in a particular machine, so that the degree of emulsion improvement of which it is capable can be recognized. Once the form of mechanical treatment for a product has been selected, then if a particular market offers a choice of machines in that class, comparative, large scale tests should be undertaken before a final decision to purchase is made. But be sure that the comparative tests are large scale, as completely misleading results can be obtained on small, pilot plant scale batches.

It is probably fair to say that most new products are completed in respect of their chemical formulation whilst still in the laboratory stage, and consequently before any large scale tests using factory equipment have been carried out. Particularly with emulsified preparations, this procedure can be hazardous, as unfortunately no laboratory equipment quite reproduces the exact conditions that the emulsion will have to withstand in full scale manufacture. Therefore, if a particular degree of mechanical improvement of an emulsified product is required, then it is advisable to retain a measure of formulation flexibility during the period of finalizing the equipment to be used and the processing conditions. Having said this, the fact still remains that for any given piece of emulsifying apparatus, there exists optimum working conditions which will ensure the best emulsion structure for a particular formulation. Therefore, tests need to be made so that optimum processing conditions can be determined. No reminder should be necessary that once these conditions have been decided upon, very strict standardization of the manufacturing procedure should be enforced so as to ensure a maximum degree of batch-to-batch reproducibility.

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# News

# and Events

# Frank F. Dittrich Elected Treasurer of Ungerer & Co.

It has been announced by Kenneth G. Voorhees, president of Ungerer & Co., Inc., that Frank F. Dittrich, at a recent meeting of the board of directors, was elected treasurer of the company which has facilities in New York City and Totowa, N. J. Ungerer is one of the oldest and largest dealers of essential oils, aromatic chemicals and perfume and flavor specialties.



Frank F. Dittrich

Mr. Dittrich was formerly controller of Ungerer & Co., Inc., and has been associated with the firm for over sixteen years. He is also secretary-treasurer of The Essential Oil Assn. of U. S. A. Mr. Dittrich is a native of Yonkers, N. Y. and is now a resident of Spring Lake Heights, N. J.

### President of F. E. M. A. Dies on Eve of 49th Convention

Myron J. Hess, president of the Flavoring Extract Manufacturers Assn. died at his home in Narberth, Pa. May 17 on the eve of opening of the 49th annual convention of the association in the Edgewater Beach hotel, Chicago, at which he would have presided. He was 62 years old.

He was graduated as a chemist from the University of Pennsylvania in 1924. He joined the S. Twitchell Co., Camden, N. J. as a chemist and later became president. Mr. Hess served on the board of governors of the F. E. M. A. for six years. He is survived by his widow and daughter.

# Elizabeth Arden Stages **Blue Grass Party**

With the usual good taste that marks the receptions of Elizabeth Arden, a Blue Grass Party was held in the attractive and spacious roof of the St. Regis hotel on the afternoon and evening of May 21. Fashions for Blue Grass time, a Viennese waltz contest, music and dancing all combined to give members of the press and guests an enjoyable time. Miss Arden and Jack Treat as well as members of the staff greeted guests as they arrived.

## **Enid Edson** Now in France

Mrs. Enid Edson sailed for France May 21 where she plans to spend a month working on new plans and packaging with the executives of Parfums Ciro in Paris. President Charles A. Pennock of Parfums Ciro was among those who bade farewell to Mrs. Edson at the sailing of the Queen Mary. The Folding Paper Box Assn. recently singled out Mrs. Edson for the merit award for outstanding use of two color printing and lithography on the folding carotns for Parfums Ciro.

## Dr. Arthur Cade, Bacteriologist Retires after 35 Years

Dr. Arthur Cade, chief bacteriologist for Givaudan-Delawanna Inc. and its affiliate company Sindar Corp. who has been in the antiseptic-germicide field for over 35 years, has retired. Dr. Cade earned his masters degree at the University of Minnesota in 1917 and his Ph.D. degree from the same institution in 1933. For a while he taught organic chemistry. He then went to the National Carbon Co. in Freemont, Ohio and later joined the Prest-O-Lite Co. both of which were units of the Union Carbide & Carbon Corp. Later he was a fellow in organic chemistry for the Union Carbide & Carbon Corp. at the Mellon Institute. Subsequent to that he was chief chemist for the Lavoris Chemical Co. and then the Rilling Arnao Co. Rilling Arnao sold out and after a short while Dr. Cade in 1940 joined the Givaudan organization with whom he has been until his retirement. Dr. Cade is the author of a number of text books and many technical papers.

## Two Speakers Discuss Same Subject for Perfumers Society

"The Synthetic Aromatics of Hoffmann-LaRoche" was the subject of an address by Dr. Alfred Ofner, director of technical research and development and Marshall Bennett, perfumer, both of Hoffmann-LaRoche, at the May 21 meeting of the American Society of Perfumers. Both discussed from their specialized viewpoints the application of new aromatics and the outlook for further developments. Both speakers held the close attention of the large audience and answered questions at the conclusion of their lectures. The evening was rounded out with the showing of a color film "The Story of Roses" produced by Jackson & Perkins, rose growers.

Jacques Masson, president, presided at the meeting with his usual skill and Dr. Oliver Marton introduced the speakers.

# Refillable Aerosol Perfume Dispensers



An aerosol dispenser that holds 250-300 measured applications of fragrance, in a container no larger than a lipstick case, has been introduced by the Risdon Manufacturing Co. The new dispenser, the Mini-Mist, is believed to be the smallest aerosol perfume container ever made. It is refillable because the cartridge containing the fragrance can be easily removed from the outer case and then replaced. The case shown here features a modern geometrical design of diamondshaped gold lines etched into the silver background. The cap, not shown, has a silver finish. The cartridge in use in this case is aluminum while the actuator has a highly polished gold finish. The newly patented aerosol valve is made entirely of nylon and aerosol-resistant rubber to insure that no metal comes in contact with the fragrance.

# Scovill Manufacturing Co. Announces New Container



Scovill Manufacturing Co., Cosmetic Container Division, announces a new Eyeshadow Stick Container that has been produced exclusively for House of Stuart, Inc., of Newark, N. Y. This Eyeshadow Stick Container has a finish of polished brass and wide bands of pink and white, surmounted by the Stuart crest.

# Byron N. Thompson Joins van Ameringen-Haebler

Byron N. Thompson has joined van Ameringen-Haebler Inc. as technical representative of the company's aromatic chemical department in New York according to an announcement by Charles P. Walker, president of the company. Prior to joining van Ameringen-Haebler Inc. Mr. Thompson served with the Glidden Co. in market research and sales to the chemical specialty, pharmaceutical and soap industries. Befor that he had his own consulting firm working on the development of surface active compounds. Previous to World War II he was New York manager of Sharples Chemicals, Inc. where he worked with producers of synthetic detergents. He was graduated as a chemical engineer from Drexel Institute of Technology.

# Dow Chemical Co. Holds Solvents Conference

Eight Dow solvents field technical representatives recently attended a week-long solvents conference at Dow headquarters in Midland, Mich., to discuss new product developments and solvent uses in both the drycleaning and industrial field.

# Emery Industries, Inc. Moves to New Quarters

The New York sales office of Emery Industries, Inc. have been moved to new quarters at 1 Exchange Place, Jersey City, N. J. The new offices will serve as headquarters for Harry D. Armitage, Robert J. Roberts and Robert C. De-Lollis, Fatty Acid sales representatives, and George R. Williams and Robert S. Haley, Organic Chemical sales representatives.

# Givaudan Moves Executive and Sales Offices

The executive and sales offices and the perfume laboratories of Givaudan-Delawanna, Inc. have been moved to 321 West 44th St., New York 36, N. Y.

# Robinson Wagner Moves Offices

Robinson Wagner Co., Inc. and Waverly Chemical Co., Inc. have moved their New York offices to Mamaroneck, N. Y.

# Kohnstamm Takes Additional Space

To handle increased business volume and provide additional services to bottlers, V. & E. Kohnstamm, Inc. has moved its sales offices and research department to 401 Broadway, New York 13, N. Y.

# Toilet Goods Assn. Issues New Standard

The Board of Standards of the Toilet Goods Assn., Inc. has issued a standard for Dimethylpolysiloxane.

# Roy E. Webb Joins van Ameringen-Haebler

Roy E. Webb has joined van Ameringen-Haebler Inc. and will be responsible for process development and pilot laboratory operations. For the past decade Mr. Webb has been associated with the National Analine Division, Allied Chemical Corp., where he was a section leader in engineering research at the company's research center in Buffalo. He received his master's degree in chemical engineering from Columbia University after completing undergraduate work at the College of the City of New York.

# Florasynth Laboratories Acquires Laboratories of Julien Bellot



Julien Ballot

Florasynth Laboratories, Inc. announce the acquisition of the Julien Bellot Laboratories. Mr. Bellot began his career in Nice, France, then transferred his actitivities to Paris, where he worked in close association with some of the most distinguished perfumers. He came to the United States about 20 years ago and after working for a number of important firms in this country, established his own firm in New York City. He will assume the position of Research Director of the Perfume Division of Florasynth Laboratories, Inc. and will be responsible for all new developments in the fragrance field.

# The Sorbel Co. Expands Facilities

The Sorbel Co., Inc. of 110-08 Liberty Avenue, Richmond Hill, New York, announces the installation of expanded facilities for the manufacture of toilet waters, perfumes, lotions and other items of like nature. The firm which was first organized in 1930, specializes in the manufacture of cosmetic, pharmacal, automotive and chemical specialties.

# Columbia Aerosol Research Laboratory Opens



At the opening of the new Aerosol Research laboratory of the College of Pharmacy, Columbia University, are, I to r, Dr. Leonard A. Scheele, president of Warner-Chilcott Laboratories and former Surgeon General of the U. S., guest speaker; Leo Roon, chairman of the board of trustees of the college; Dean E. Emerson Leuallen; and H. R. Shepherd, president of Aerosol Techniques, Inc., through whose grant the laboratory was installed.



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# No Corporate Affiliation with W. J. Bush & Co. Webb reports

R. D. Webb & Co. an independent American corporation which took over W. J. Bush & Co. Inc. of Cos Cob, Conn. which was the American affiliate of W. J. Bush & Co. Ltd. of England has no corporate affiliation with the English company. As reported in our last issue R. D. Webb & Co. took over the trading assets and liabilities of W. J. Bush & Co. Inc. the American affiliate of W. J. Bush & Co. Ltd.



Richard D. Webb

Richard D. Webb who was treasurer of W. J. Bush & Co. Inc. is president of R. D. Webb & Co. Other officers are: Herbert S. Ogden, executive vice president; A, R. Evans (former works manager), vice president in charge of manufacturing; Benjamin J. Jarvis (former Chicago sales manager), vice president in charge of sales; Robert G. Haefner, vice president in charge of purchasing. Wallace G. Brindise becomes the Chicago sales manager, John H. Ehresmann the Los Angeles sales manager, and Spurgeon G. Bettle continues as factory superintendent. Directors are: R. D. Webb, A. B. Webb, Herbert S. Ogden and John W. Braitmayer.

# Ability to Style Hair in Three Different Ways Wins Toni Award

The ability to style her own hair three different ways with Adorn hair spray won for Miss Rita McMillan (Mrs. New Mexico) the good grooming award of fered by the Toni Co. at the recent Mrs. America contest in Ft. Lauderdale, Fla.

# Dr. Oser Receives Award for Services to Nutrition

Dr. Bernard L. Oser, president of Food & Drug Research Laboratories, received the 1958 Babcock-Hart award for his technical services to nutrition and public health at the May 27 meeting of the Institute of Food Technologists. Dr. Oser has contributed much useful information to the flavor and allied trades as well as to the New York Bar Assn. He has presented papers before the Flavoring Extract Manufacturers Assn. and other groups.

# F. A. S. Wood of Croda Ltd. Now an Honorary Texan

F. A. S. Wood, managing director of Croda Ltd., Goole, Yorkshire, England who recently visited the United States has been made an honorary Texan.

The honor is awarded only to leaders who have been outstanding in their particular fields in a way which benefits Anglo-American relations. Among others who have been awarded the honor are Sir Winston Churchill, Lord Chandon and Alfred Bossom, M. P. Mr. Wood, who is 31 years old, is the youngest executive to receive the award.

# Benson Storfer to Launch First New Perfume by Corday since 1951

Benson Storfer, president of Parfums Corday is in Paris conferring with officials of the firm there about launching the first new perfume to be distributed by Corday since the introduction of Toujours Toi in 1951. While in Paris he will participate in the Paris debut of the new perfume, which as yet is unnamed, and will make arrangements for importing it to the United States for the holiday season.

# Hearings to be Held on Ways to Protect Small Business

Senator Hubert H. Humphrey's subcommittee on retailing, distribution and fair trade practices will hold public hearings June 23, 24 and 25 on ways to protect small businesses from anticompetitive pricing practices. In Washington there is still confidence that a federal fair trade bill may be enacted before Congress adjourns.

# Texas Pharmacal Co. gets Cancellation of Aloe-Creme Trade Marks

The decision of the examiner of Interferences of the United States Patent Office sustained the petition of the Texas Pharmacal Co., San Antonio, Texas, to cancel the registration of Alo-Creme and cancelled the registration of the trade mark "Alo-Creme After Tan" both of which were used by Alo-Creme Laboratories, Fort Lauderdale, Fla. The decision is open for appeal.

The grounds for the petition to cancel the registration of "Alo-Creme" were that although the mark was registered for ointment for sunburn, burns and skin injuries the goods actually sold by Alo-Cream Laboratories under its trade mark were identical to the class of goods sold by Texas Pharmacal Co. under its mark and since the marks were substantially the same in appearance, and sound confusion was likely to arise.

was likely to arise.

Texas Pharmacal Co. opposed the registration of "Alo-Creme After Tan" by Aloe-Cream Laboratories for a lotion for skin grooming because of its prior registration of "Saf-Tan" or a protective cream to prevent sunburn, and the associated use thereof with its mark "Allercreme" and the likelihood that the applicant's mark "Alo-Creme After Tan" would be confused with Texas Pharmacal Co.'s "Allercreme Saf-Tan".

# Avon Products Inc. to Expand Export Business in Next Two Years

President John A. Ewald of Avon Products Inc. has announced that the company plans to sell its products in Great Britain, Brazil and Germany within the next two years. This follows the successful marketing of its products in Venezuela, Mexico, Canada, Cuba and Puerto Rico.

## Puerto Rico Gets New Perfume Plant

Giles & Kendall Inc., Huntsville, Ala., manufacturers of oil cedar wood, is establishing a perfume-cologne plant in Puerto Rico.

The new affiliate of the company is named Gilco Corp. and is located in Hato Rey, a suburb of San Juan. Liquid perfumes and colognes will be produced from flowers brought into Puerto Rico from the United States. Most of its production will be sold in the United States. Burt Evans is to be plant manager and 20 workers will be employed in a plant in which \$25,000 worth of equipment is now being installed.

# D. C. A. T. Meeting to be Held Sept. 11-14 in Lake George

The annual meeting of the Drug, Chemical and Allied Trades Section of the New York Board of Trade is to be held Sept. 11-14 in the Sagamore hotel, Lake George, N. Y.

# Major Development in Packaging Film Announced by Dow Chemical

A new low cost polystyrene film selling at a low price has been developed by the Dow Chemical Co. for use in a wide variety of general merchandise packaging applications. It is called Trycite and will be manufactured in Cleveland starting next January. Trycite is the first commercially feasible packaging film to be produced out of polystyrene the most economical of all plastic resins. It is stated to be a breathing film that does not absorb moisture, distort or become brittle with age. It has been field tested for several years.

# New Belgian Subsidiary of Croda Ltd. Now in Operation

The new plant of Croda Belge, subsidiary of Croda Ltd. of Goole, Yorkshire, England, in Vervieux, Belgium, has been completed and is now in operation. Lanolin and its derivatives are being manufactured in the new plant.

# Joseph Morel

Joseph Morel, for 27 years director of the factory of Lautier Fils, Grasse. France and formerly chairman of the French National Syndicate of Manufacturers of Essential Oils and Aromatic Products, died recently in Grasse. He was educated at the University of Lyon. Mr. Morel was highly regarded in the business world and served as a consultant for the Bank of France.

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# RSONALITIES

Richard N. Parks has been elected vice president for sales of Shulton, Inc. according to an announcement by George L. Schultz, president of the firm. Mr.

Jean Maubert, chief administrator for P. Robertet, Inc., has been appointed Conseiller du Commerce Exterieur de la France, by decree of 14 April, 1958. This

Robert W. Teegarden has been promoted to general manager of the Union Beach plant of van Ameringen-Haebler, Inc. Mr. Teegarden has served as head



Richard N. Parks

Jean Maubert





Robert W. Teegarden

Parks has served as general sales manager since 1956. He joined Shulton in 1948 to take charge of market research and sales analysis and was appointed manager of the Eastern Division in 1952. is a singular recognition and especially noteworthy since it is not customary in France to make such awards to young men. Mr. Maubert has many friends in United States which he visits annually.

of the research department, and in various other capacities in production, since joining the company in 1932. Prior to 1932 he was associated with the Fischer Soap and Oil Co.





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David Gregg Jr. has been elected vice president of the International Division of Shulton, Inc. Mr. Gregg has served as manager of the International Div. Jack Abrams, treasurer and comptroller of Max Factor & Co., was elected to the company's board of directors at the firm's annual stockholders Cornelius D. McGrath and George S. Cripps have been named managers of industry marketing groups in the chemicals division of Atlas Powder Co. Mr.



David Gregg Jr.

since 1956. He joined Shulton in 1950 and was appointed Assistant to the President—Foreign in 1955.

Edwin L. Ramsey Jr., director of the new product division of Rexall Drug Co., has been elected vice president in an expansion of his division. Mr. Ramsey joined Rexall in 1946. In his new position as vice president in charge of the new product division, he will supervise operations of the research and development laboratories, as well as marketing research and packaging research for new products.



Jack Abrams

meeting. All eight other directors were re-elected. Mr. Abrams has been an officer of Max Factor & Co. since 1939 when he joined the company as its comptroller. He was named treasurer of the company in 1955.

Dr. Wilbur B. Pings has been appointed general manager of the Kessler Chemical Co. of Philadelphia. Prior to this appointment Dr. Pings had been with the experimental station of E. I. duPont de Nemours & Co. of Wilmington



Cornelius D. McGrath

McGrath will have charge of the cosmetic and pharmaceutical industries group, while Mr. Cripps will be responsible for the food industries group.

Joseph A. Danilek, president of Mary Chess Inc. and of Parfum Schiaparelli, Inc., flew to England on May 31 to inspect the London offices and plant of Mary Chess Inc. After spending a week in London he flew to Paris to look over the Schiaparelli layout which Mary Chess recently purchased. He returned to New York in time to attend his son's graduation.



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Mark L. Arend's re-election as president and the election of John V. Page as executive vice president were among the major executive appointments made

Mark L. Arend

at the annual stockholders meeting of Rayette, Inc. Dr. William Reveley, former manager of hair products research and chemical developments, was elected vice president in charge of the research division and chemical operations. Reelected officers are Sam Goodman, vice president of marketing, and Walter Niemiec, vice president of manufacturing.

James Bosek has been appointed assistant to Ralph Lewis, president of Jaquet. Mr. Bosek was formerly with Houbigant as sales representative.

Ray Hogan has been appointed to the sales staff of Perry Bros., Inc., Mr.



Ray Hogan

Hogan had been associated with Roure-Dupont and with Rhodia, Inc. for several years.

Wilfrid F. Beauchamp, vice president in charge of the Montreal branch of George Lueders & Co., was elected a director to fill the vacancy left by the late Mr. Weber.

John R. McClelland retired as technical director of Home Products International Ltd., after many years of service. William J. Mead has been appointed to succeed Mr. McClelland in this position.

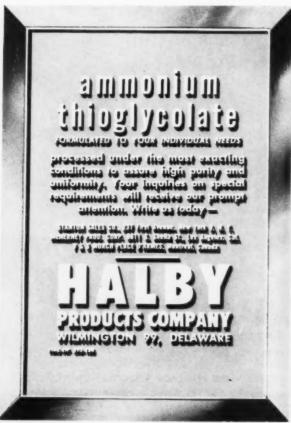
William H. O'Brien was elected to the Board of Directors of Shulton, Inc. at the recent annual meeting of stockholders. Mr. O'Brien has been vice presi-



William H. O'Brien

dent for finance since May 1957. He joined Shulton in 1953 as Assistant Controller and was named Controller and Assistant Treasurer in 1954.

Philip Chaleyer accompanied by Mrs. Chaleyer are in Europe on a six weeks business and vacation trip which will include visits in France, Switzerland and Italy. While in France he will visit relatives in Paris and Lyon. This was Mr. Chaleyer's 30th crossing of the Atlantic ocean.







Cross Dandruff Treatment Purity Shampoo which was introduced in 1949 has been acquired by The Odell Co., 230 Wright St., Newark, N.J. manufacturers of Trol hair tonic, Odell Hair Trainer and other toilet preparations. The Odell Co. was established in 1895.

The second annual Beautyrama, the beauty care show sponsored by the Philadelphia Inquirer in cooperation with cosmetic manufacturers will be held in the Sheraton hotel, Philadelphia, September 3, 4 and 5.

Imitation vanilla flavor shipped by the Serv-Agen Corp. containing coumarin was seized and destroyed by the Food & Drug Administration recently. The shipment consisted of 87 cases of 8 oz.

Atlas Powder Co. dedicated its new technical center in suburban Wilmington, Del. May 23. The three million dollar facility will house the company's basic research and chemical product development activities. Gov. J. Caleb Boggs of Delaware was the chief speaker at the dedication. President Ralph K. Gottshall of Atlas Powder Co. also spoke explaining the purpose and aim of the new center.

The National Beauty and Barber Manufacturers Assn. will hold its annual meeting in the Conrad Hilton hotel. Chicago, August 20.

Prices of oil orange sweet California. Exchange brand, cold pressed have been increased to \$3.35 per pound in 35 lb. cans or 385 lb. drums. The oil is in scant supply and the distributors cannot enter into contracts and all orders are subject to availability. Oil orange sweet California distilled, Exchange brand, is available in 35 lb. cans and contracts can be accepted Fritzsche Brothers Inc. report.

The proposed federal fair trade bill was eloquently supported by Jean Despres, executive vice president of Coty Inc. and by George F. Smith, president of Johnson & Johnson as representatives of the cosmetic manufacturers and drug manufacturers at the recent hearings in Washington. The Justice Dept. and the Federal Trade Commission as expected opposed the bill. Retail trade groups were also represented favoring the bill.

Vigorous support for a workable, constitutional method by which trade mark owners may move to protect their property rights in trade marks and to protect their retailers and the public from predatory trade practices is urged by the American Fair Trade Council. Suggestions are to be welcomed from any source to accomplish this purpose.

More than 20,000 retail establishments of all kinds will be personally interviewed to provide a nationwide count of retail outlets which carry a product category, a separate brand and competitive brands in a survey by Audits & Surveys Co., New York. The survey is designed for consumer goods manufacturers. The information will be broken down by type and size of store and by whatever sales regions, city sizes and volume difference a manufacturer may find particularly useful.

Sixty pertinent questions to probe a company's weak spots are given in the Nielsen Researcher for May. The questions cover the efficiency of a company's sales, advertising, merchandising, production and product research. Copies may be had by writing to the A.C. Nielsen Co., 2101 Howard St., Chicago, 45.

For 40 years or longer three active employes have been serving Lehn & Fink Inc. and 65 have been with the company for more than 30 years. They are members of the company's Quarter Century Club which includes all employes who have been with the company over 25 years. They now number 116 or more than 8% of the concern's 1,400 employes. In addition 25 members have retired. Gifts from the management are presented as employes become eligible for the club.

The National Directory of Discount Dealers, third edition, containing 3,100 names and addresses listed alphabetically by stages and cities has been issued by Hoge, Farrell Inc. It sells for \$9.95.

Past presidents of the Chemical and Allied Industries Assn. of Michigan were honored at a dinner meeting recently in

Unilever, London, England, world's largest advertiser spent \$232,-400,000 on all forms of advertising throughout the world in 1957 according to Lord Heyworth, chairman of the board. The expenditures covered many brands and a wide range of goods such as soaps, toilet preparations, etc. The expenditures were spread over almost 200 companies and more than 100 countries. An estimated \$60,100,000 was spent in 1956 by the Lever Bros. Co., New York, a subsidiary of Unilever. The 1957 figures were not disclosed.

Prizes costing \$20,000 in the Luxury Living contest of Associated Products Inc., manufacturers of 5 Day Deodorant Pads, have been awarded to the winners by Bernard Gould, vice president of the company. Prizes were also given to retailers in whose stores the entry blanks were obtained by the top 50 winners.

# Alpine

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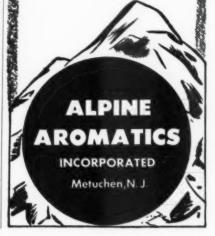
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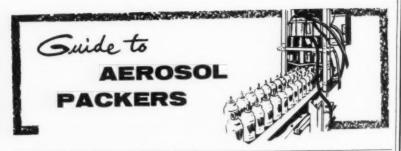
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# Seasonal Demands Spur Prices

Limited supplies and more pressing seasonal demands carried prices on Floridian orange oil and orange specialty items into new high ground. Other firm spots in the market included Algerian and Bourbon geranium oils, vanilla concentrates, and lemon and lime oils. Buying of oils and specialty items

for the account of the food and beverage trades has been running into a good volume with suppliers looking forward to an expanded volume in sales with the opening of the summer vacation period. Oils and aromatic chemicals used in perfume compounds were likewise moving in good volume.

# PRICE CHANGES

Advances	Current	Previous
Rhodinyl acetate	\$ 41.00	\$ 39.50
Rhodinol		
Standard	38.00	35.00
Extra	47.00	44.00
Oil geranium		
Algerian	15.50	14.50
Bourbon	17.00	15.00
Oil cubeb	13.00	11.00
Oil orange		
*California coldpressed	3.35	2.35
*California distilled	1.25	0.90
Florida	1.75	1.60
West Indian, bitter	3.75	3.60
Copra, coast, ton	190.00	187.50
Castor oil, imported	0.16	0.151/2
Cocoa butter	1.00	0.92
Declines		
Menthol Balsam, Peru	\$ 1.35	\$ 1.65
Brazilian	5.30	5.60
Synthetic, laevo	5.60	5.75
Oil anise	3.00	3.15
Oil clove leaf	0.85	0.87
Oil ginger	12.50	12.75
Oil guaiac wood	0.90	1.00
Oil lavindin	1.50	1.75
Oil lemongrass	1.05	1.15
Oil mandarin	7.75	8.25
Ionones, alpha, beta	4.20	4.55
Oleic acid, tanks	0.14	0.16
Stearic acid, single pressed	0.141/4	0.151/4
Oil palmarosa	4.25	4.75
(Prices per pound unless otherwise spe	ecified) *Exchange Brand	

## GERANIUM OUTLOOK STRONG-

Despite prospects of increased buyer resistance to the steadily advancing prices for geranium oil in the months ahead, reports from Reunion Islands do not suggest any relief in the exceedingly tight supply position of the market. The geranium plants were destroyed by two severe storms, the first hitting the growing area in March, and the second appearing early in April. Shipping prices have already advanced \$10 per kilo with sellers holding out for still higher levels on remaining unsold lots of oil. A normal Spring crop of about 20 metric tons is expected in Algeria, but the steadily mounting prices on Bourbon oil is likely

to carry prices on Algerian oil to higher levels,

# ORANGE SUPPLY ACUTE-

After starting at a price level of 50 to 55 cents per pound in December, Floridian orange oil has been steadily climbing as the result of crop damage caused by freezing temperatures in the early months of this year. Latest quotations on the article of \$1.75 to \$1.80 per pound are entirely nominal in the complete absence of firm offers. Toward the close of last month prices on Exchange Brand California orange jumped \$1 per pound to \$3.35. Distilled Californian oil was advanced to \$1.25 per pound.

### STYRAX TO REMAIN SCARCE-

All indications suggest a continued shortage of Asiatic styrax gum. The long awaited auction in Turkey was said to have been held a few weeks ago. Purchases were largely for the account of speculators. They are asking as much as \$2.50 per pound for material for shipment or a price above nominal spot quotations of \$2.25 to \$2.35 per pound. Importers here are refusing to meet the high prices.

### GERANIUM DERIVATIVES ADVANCE-

Rhodinol and rhodinyl acetate quickly responded to the sharp rise in geranium oil prices. The derivatives, used by soapers and perfumers, attracted a fair amount of buying interest on the advance. Regular grade rhodinol was boosted to \$38 while the extra grade rose to \$47 per pound. The advance in rhodinyl acetate carried spot prices to \$41 to \$43 per pound.

### OLEIC ACID, STEARIC ACID CUT-

Oleic and stearic acids suffered losses of 2 cents and 1 cent per pound, respectively, as the result of competitive conditions and reasonably large stocks. The tankcar price for oleic acid was reduced to 14 cents per pound. The reductions represented the first change in these fatty acids in some time.

### CRUDE GLYCERIN IRREGULAR-

The trend in domestic crude glycerin was irregular. After early sales of soap lye at 16 cents per pound, the market fell back to its former level of 15½ cents. Domestic prices for refined glycerin were unchanged. There continues a feeling of uncertainty regarding the future trend of the market. In addition to large stocks, reasonably large quantities moving into the export market at reduced prices served to have an unsettling influence.

# MINT OILS STEADY-

Some low priced offerings of Far-Western peppermint oil were noted but prices from the Mid-West were generally steady and dealers were having little difficulty in obtaining full prices for their oil for export. Stocks of both spearmint and peppermint have been reduced by steady withdrawals against contracts for the account of large buyers, and it will be another three months before new crop oils will come into the market.

### MENTHOL WEAKER-

Brazilian menthol suffered a further decline over the past month, hitting a new low of \$5.30 to \$5.35 per pound. Synthetic laevo menthol dropped to \$5.60 to \$5.75 but makers have been kept busy filling deliveries against orders placed earlier in the year. The tobacco trade, large users of menthol, have been buying synthetic material, according to reports.

### VANILLA BEANS SCARCE-

Spot prices on both Mexican and Bourbon vanilla beans are firm. With less than half of this year's crop of Bourbon beans already sold, recent bids for additional quantities have been rejected by exporters in Madagascar.

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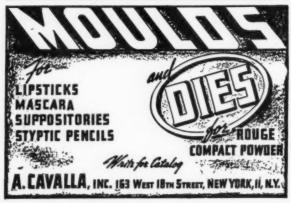
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**JULY 1958** 

Published by Moore Publishing Company, Inc.
Publication Office: Emmett Street, Bristol, Conn.
Editorial and Executive Offices: 48 West 38th Street, New York, N. Y.

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